

OPERATOR'S MANUAL

OM-C20012

ISSUE C9

JOHN DEERE

400

GRINDER-MIXER





TO THE PURCHASER

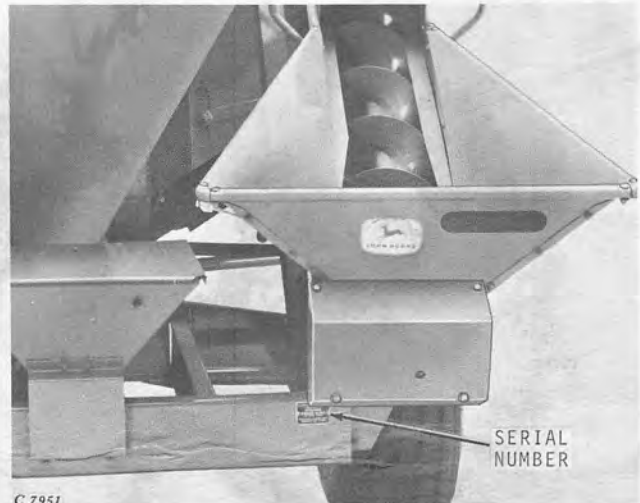
Make this manual your guide and do what it recommends for operating, lubricating, and servicing your new John Deere 400 Grinder-Mixer. These instructions have been written specifically for this grinder-mixer; other grinder-mixers may operate differently.

Long life and satisfactory performance of this grinder-mixer will depend upon your following the instructions given in this manual. Be sure to keep the manual in a safe, convenient place so you can refer to it quickly. Be sure to read the Safety Suggestions on page 18. Insist that they be followed by those working with you and for you.

When not grinding, mixing, or delivering feed with the grinder-mixer, it should be stored in a shed or covered so rain, snow, and dirt cannot get into the machine.

INFORMATION CONCERNING WARRANTY

The warranty on this grinder-mixer appears on your copy of the purchase order which you should have received from your dealer when the grinder-mixer was purchased.



PARTS AND SERVICE

When in need of new parts or service, see your John Deere dealer. He is equipped to provide genuine John Deere replacement parts; his servicemen have the training and experience to service your equipment efficiently.

SERIAL NUMBER

The serial number of your new 400 Grinder-Mixer is located on the frame as shown in the illustration. Record this number in the space below for reference when requesting information or ordering parts.

JOHN DEERE 400 GRINDER-MIXER

Serial No.

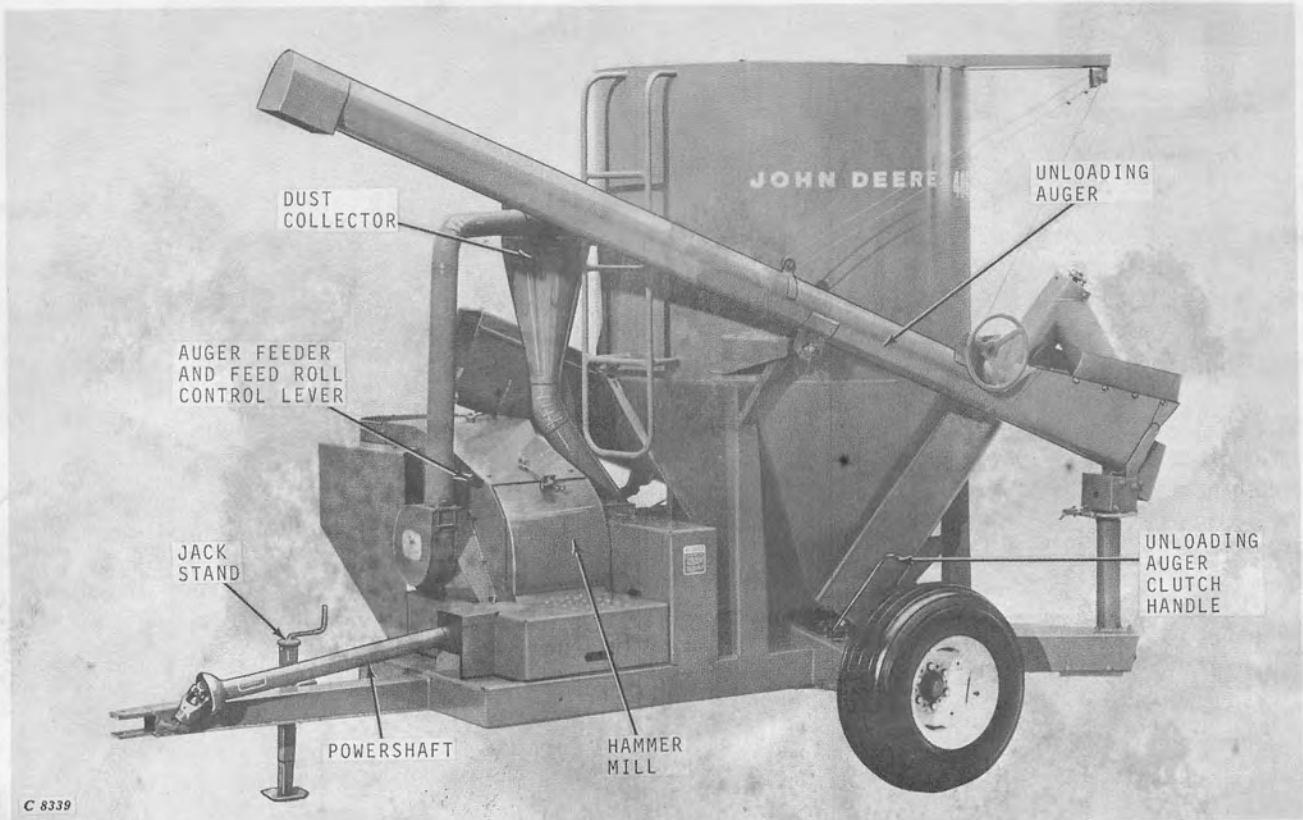
Date Purchased19.....

(To be filled in by Purchaser)

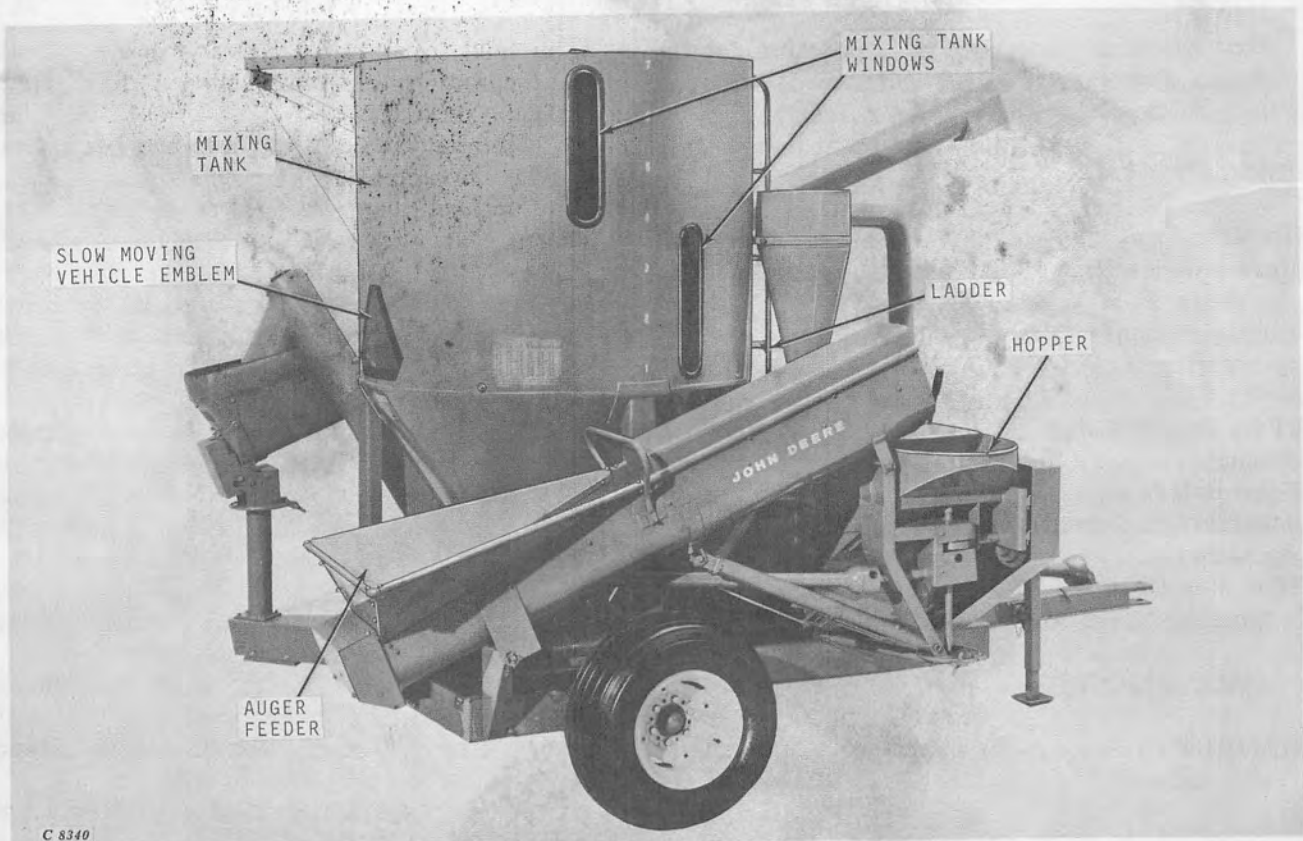


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Left-Hand Front View of John Deere 400 Grinder-Mixer



Right-Hand Rear View of John Deere 400 Grinder-Mixer



SPECIFICATIONS

Grinder-Mixer (With 540 rpm Drive, Auger Feeder and Feed Roll):

Mixing Tank Capacity	82 Bushels (2 Tons)
Height	107-1/2 Inches
Length	161-5/16 Inches
Width	96 Inches
Weight	2666 Pounds
Mixing Auger Diameter	12 Inches
Unloading Auger:	
Diameter	6 Inches
Length	13 Feet
Pedestal Height	45 Inches
Discharge Rate	16-1/2 Bushels per Minute

Hammer Mill:

Hammers	26 4-Way Reversible
Size	17 Inches with 20-Inch Throat
Screen Area	506 Square Inches
Screens Available	12 with hole diameters from 3/16 to 1-1/2 Inches
Operating Speed	2200 rpm
Drive	4-1/2-Inch, 24-Groove, Poly-V Belt
Tire Size	7:50-16 10-Ply 11:00L-15 8-Ply (optional)

Auger Feeder:

Diameter	10 Inches
Speeds	29, 55, or 103 rpm

(Specifications and design subject to change without notice.)

DESCRIPTION

The 400 Grinder-Mixer is a portable feed grinder and mixer. It is PTO driven at either 540 or 1000 rpm. The drive is designed for tractors with a maximum of 90 hp at the rated PTO speed.

All types of grain as well as hay can be ground with the Grinder-Mixer. The concentrate hopper allows concentrates to be added directly to the mixing tank.

The mixing tank auger continually mixes the feed as it is transported to the feedlot for unloading into the feeder.

The bulk of the ground feed goes directly from the hammer mill into the horizontal auger which carries it to the mixing tank. A suction fan takes off the air pressure developed in the hammer mill and delivers the fine feed through the dust collector into the horizontal auger.

The unloading auger pivots 225 degrees around its high base and will unload the tank in 5 minutes to heights up to 12 feet.

The concentrate hopper, protected by water-tight cover, is conveniently located at the rear of the machine.

The feed level in the tank is visible through the two safety glass windows staggered along the side of the mixing tank.

A ladder on the front of the tank gives access to the spring-release door on the top of the tank.

The optional auger feeder is spring counter-balanced for easy handling and can operate throughout its 120-degree pivot arc. The auger feeder is equipped with a safety clutch so it can be started or stopped independently of the mill.

A feed roll, available as extra equipment, helps pull baled hay slices into the grinder, gives a smoother flow of all materials into the mill, and also increases the mill capacity when grinding small grains.

A magnet can be added to the mill to help protect the machine and the feed from tramp iron particles.

Fenders also are available to protect the grinder-mixer and the operator when transporting the grinder-mixer in wet, muddy conditions.

A double sacking spout, available as extra equipment, is easily attached to the unloading auger to aid in bagging ground feed.

Twelve screens are available in hole sizes from 3/16 to 1-1/2 inches.



OPERATION

PREPARING THE GRINDER-MIXER

Before operating the 400 Grinder-Mixer, read the safety suggestions on page 18 and check the machine thoroughly, especially these areas:

Lubrication. Be sure the grinder-mixer has been lubricated as shown on pages 19 through 22.

Belts. Check the tension of the Poly-V drive belt as shown on page 16. Check the tension of the auger feeder drive belt (optional equipment) as shown on page 16.

Chains. Check the chain adjustment as shown on page 17.

Tire Inflation. Check to be sure the tires recommended for use with the 400 Grinder-Mixer are properly inflated. Inflate the 7.50-16, 10-ply tires to 56 psi air pressure. Inflate the 11:00L-15 8-ply tires to 36 psi air pressure.

PREPARING THE TRACTOR

TRACTOR REQUIREMENTS

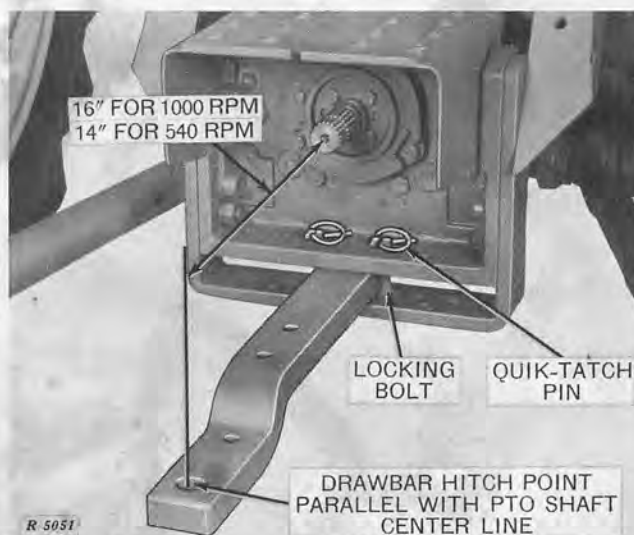
The John Deere 400 Grinder-Mixer may be used with John Deere 2020, 2520, 3020, 4000 and 4020 Tractors. Other tractors with horsepower equal to or greater than the John Deere 2020 Tractor may also be used.

A regular 540 rpm PTO can be used with tractors up to 70 hp having 540 rpm power take-offs. A heavy-duty 540 rpm PTO is recommended for use with tractors over 70 hp.

IMPORTANT: Many tractors are equipped with a PTO drive train designed to operate at 1000 rpm. For improved performance and longer tractor and implement life, this grinder-mixer should be operated by the 1000 rpm PTO shaft, whenever such a PTO speed is available on the tractor.

CAUTION: Regardless of the tractor used, always transport a loaded grinder-mixer at a slow speed (10 mph or less) and be extra careful when transporting in hilly country.

ADJUSTING TRACTOR DRAWBAR



Place the drawbar in the extended position, with the hole in the end of the drawbar 14 inches (540 rpm operation) or 16 inches (1000 rpm operation) from the end of the PTO shaft.

Lock the drawbar in its crossbar, parallel with the centerline of the powershaft, placing the locking bolts on either side of the drawbar.

NOTE: If the tractor has an offset drawbar, offset should always be down for PTO work.

FRONT END WEIGHTING

Provide sufficient weighting to stabilize front end of tractor when operating on hilly land or other adverse conditions. See your tractor operator's manual for front end weighting information.

REAR WHEEL SPACING

For maximum stability in hilly land or other adverse conditions, adjust wheel spacing to widest setting as shown in the tractor operator's manual.

TIRE INFLATION

Check front and rear tractor tires to be sure they are inflated according to the recommendations given in the tractor operator's manual.

ATTACHING TO TRACTOR

ATTACHING HITCH



Use the handle on the jack stand to raise or lower the grinder-mixer hitch into position to engage the tractor drawbar.

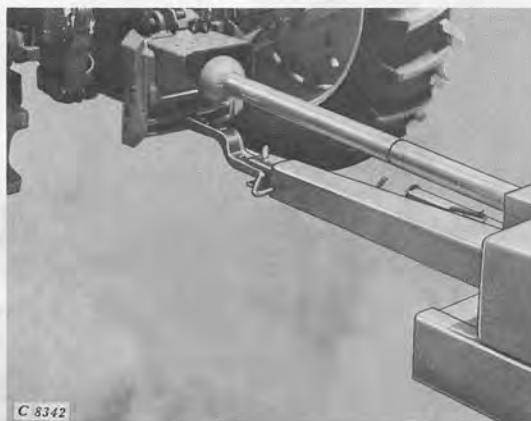
The drawbar must be between the upper and lower plates of the hitch clevis. Carefully back the tractor into position and insert the hitch pin through the upper clevis plate, drawbar, and lower clevis plate. Secure the hitch pin with the spring locking pin.

CAUTION: Do not transport the grinder-mixer unless the spring locking pin is installed in the hitch pin.



Place jack stand in transport position.

CONNECTING POWERSHAFT



The PTO operating speed of the tractor and grinder-mixer must be the same. The tractor half of the powershaft is equipped with six splines for 540 rpm operation or 21 splines for 1000 rpm operation.

IMPORTANT: Be sure grinder-mixer is equipped with 1000 rpm drive when operating with a tractor equipped with 1000 rpm PTO drive. See pages 25 through 27.

Connect the powershaft to the tractor power take-off shaft. After making the connection, check to be sure the spinner shields are free to rotate.

DETACHING FROM TRACTOR

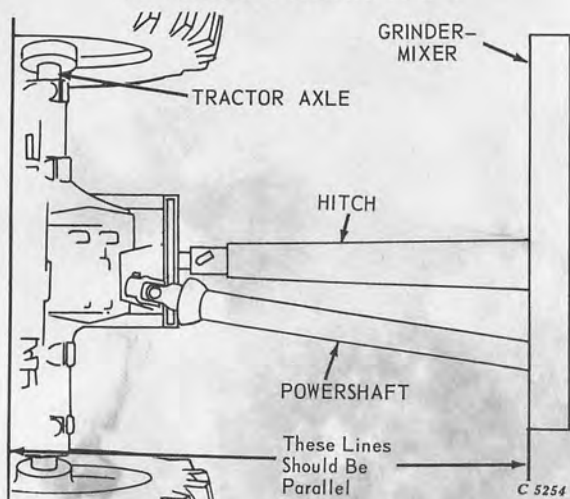
CAUTION: To avoid possible backward tip of the grinder-mixer with load in tank, always block rear of chassis before unhitching the grinder-mixer from the tractor. Do not remove the block while the grinder-mixer is unhitched from the tractor.

Disconnect the powershaft from the tractor and return it to the storage bracket. Lower the jack stand and install jack stand retaining pin and "Quik-Lock" pin. Use the jack stand handle to raise the grinder-mixer off the tractor hitch.

Remove the spring locking pin and hitch pin from the grinder-mixer hitch clevis. Drive the tractor away from the grinder-mixer and replace the hitch pin in the grinder-mixer hitch clevis.

OPERATING THE GRINDER-MIXER

ALIGNING POWERSHAFT



Whenever grinding, be sure the tractor axle and the front of the grinder-mixer hitch frame are parallel as shown above.

IMPORTANT: Whenever mixing while transporting, avoid sharp turns which may damage the powershaft.

For information regarding proper power take-off operation, see your tractor operator's manual.

HAMMER MILL

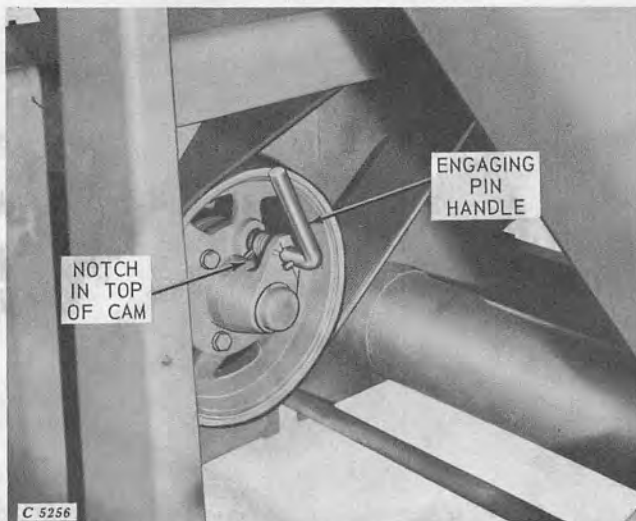
CAUTION: Disengage all drives and shut off tractor engine before engaging or disengaging the hammer mill.

ENGAGING HAMMER MILL



To engage the hammer mill, rotate the engaging pin handle in a clockwise direction. Turn the pulley until the pin engages one of the holes in the drive hub.

DISENGAGING HAMMER MILL



To disengage the mill, rotate the engaging pin handle in a counterclockwise direction. Be sure spring pin engages notch at top of cam.

INSTALLING HAMMER MILL SCREENS

CAUTION: Disengage all drives and shut off tractor engine before installing or changing hammer mill screens.



Extra screens may be carried in the convenient carrier.

To remove a screen, raise the cover and secure it with the catch. Remove a screen from the carrier and replace the cover.



Loosen hand nut on hammer mill access cover retaining bolt. Swing bolt out of locking lugs and lower the mill cover.



Push screen support down and drop screen into hammer mill.

Close mill cover and secure with retaining bolt and hand nut.

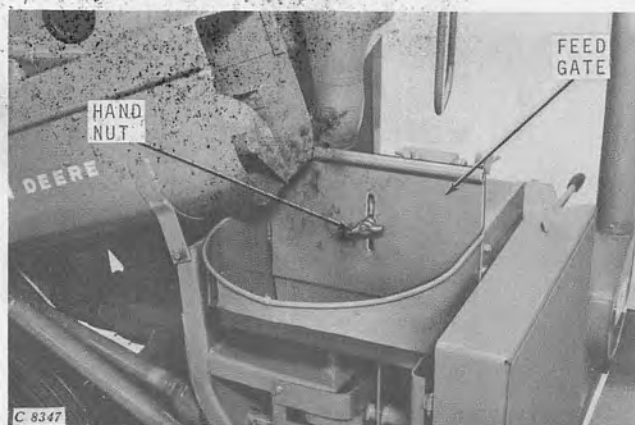


To change a screen, open the hammer mill as described previously and push the screen support down.

Insert screen hook as low as possible on screen and pull up and out. Install the new screen as described previously.

Place screen removed from hammer mill in screen carrier as shown on page 6.

FEED GATE



The feed gate may be raised or lowered to govern the flow of material to the mill.

Loosen the hand nut and raise or lower the feed gate to the desired height and retighten the hand nut.

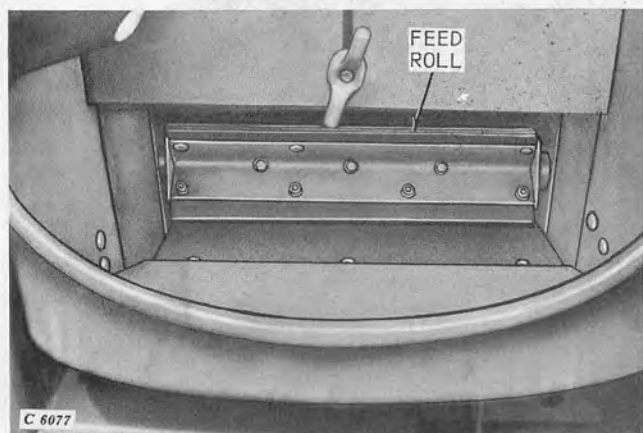
CONCENTRATE HOPPER



Add concentrates or supplements through the concentrate hopper during the first half of the grinding operation to allow enough time for thorough mixing with the ground feed. See pages 10 and 11 for suggestions on adding and mixing supplements.

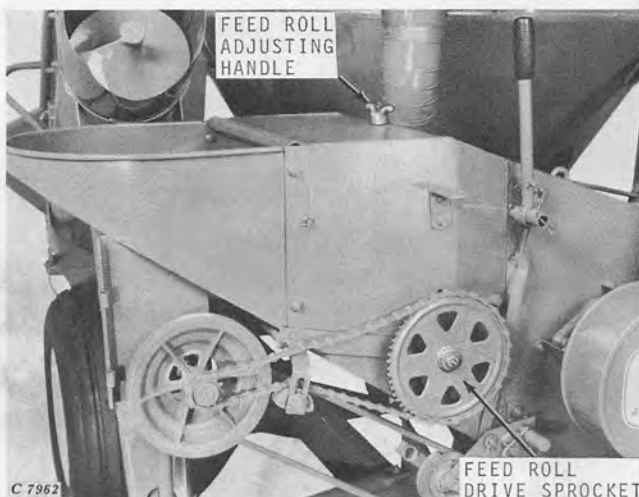
Keep hopper cover closed when concentrates are not being added.

FEED ROLL (Extra Equipment)



The feed roll aids in feeding hay slices into the hammer mill in addition to providing a smoother flow of any grain.

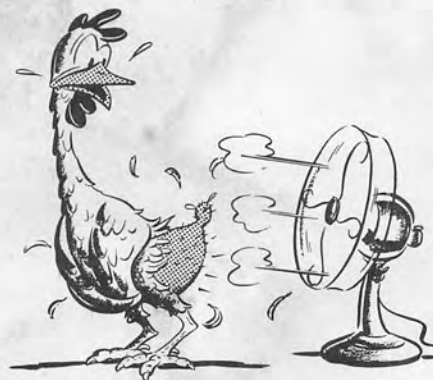
When the grinder-mixer is equipped with a feed roll, the feed roll should not be so low that it restricts the flow of material into the mill, or so high that it does not contact the material being fed into the mill.



Shield Removed for Illustration Purposes Only

To raise the feed roll, turn the adjusting handle in a clockwise direction. To lower the feed roll, turn the handle in a counterclockwise direction.

CAUTION: Be sure safety shield is in place before adjusting feed roll.



**Be Extra Cautious
around Moving Machinery!**

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AUGER FEEDER (Optional Equipment)

CONTROLS



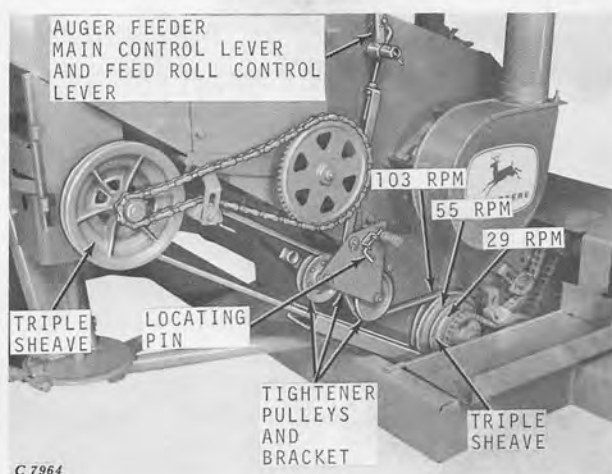
The auger feeder has two controls. One is located on the mill and the other is located on the feeder itself.

To engage the auger feeder, raise the lever on the mill to the vertical position. To disengage the feeder, push the lever down.

NOTE: Use the auger feeder main control lever to engage and disengage the auger feeder whenever possible. The auxiliary control lever may be used to disengage auger feeder in an emergency.

To engage the auger feeder with the auxiliary control lever, move the lever toward the hopper end of the feeder. To disengage, move the control bar toward the discharge end of feeder.

AUGER FEEDER AND FEED ROLL SPEED



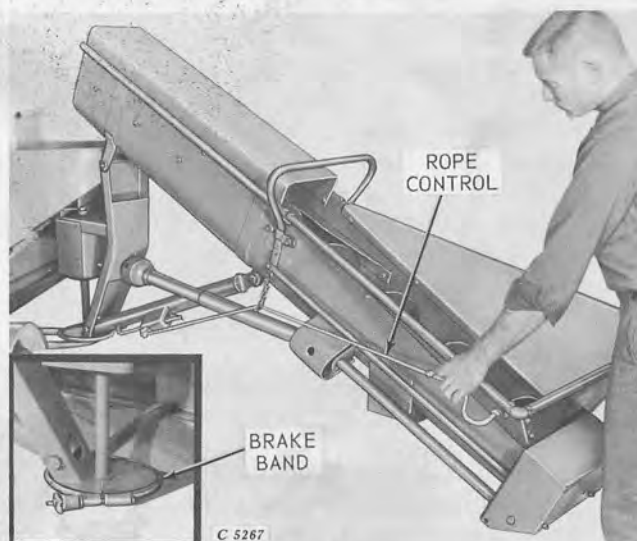
The auger feeder and feed roll may be run at one of three speeds: 29, 55, or 103 rpm.

To change the speed, first disengage the tractor PTO, shut off the tractor engine, and disengage the auger feeder using the control lever on the mill. Move the belt to the desired location on each of the triple sheaves. See illustration at bottom of left-hand column. Then release the spring-loaded locating pin and slide the tightener pulleys and bracket so they are aligned with the sheave to be used.

POSITIONING THE AUGER FEEDER



Remove the "Quik-Lock" pin from the auger feeder transport support.



Move the auger feeder to the desired location. Lift the feeder to raise it; pull the rope control handle to lower it.

NOTE: The auger feeder may be locked in position by tightening the hand nut on the brake band. See inset.

MILL CAPACITY

The mill capacity depends on six factors: rate of feed, screen size, type of material, moisture content of material, tractor horsepower, and mill rotor speed.

UNDERFEEDING, OVERFEEDING, OR UNEVEN FEEDING

Underfeeding of material reduces capacity, preventing the optimum operation of the mill. Overfeeding the mill tends to slow the tractor rpm, and reduces the capacity of the mill. Uneven feeding is a combination of underfeeding and overfeeding.

SCREEN SIZE

The larger screens used with the mill increase, and the smaller screens decrease the capacity of the mill.

TYPE OF MATERIAL

Grinding small grains such as barley, oats, rye, wheat, and shelled corn decreases the capacity of the mill. The feed roll can be installed to increase the capacity of the mill when grinding small grains.

MOISTURE CONTENT

High-moisture content material is more difficult to grind and reduces the capacity of the mill.

TRACTOR HORSEPOWER

The final capacity of the mill depends on the ability of the tractor to maintain the PTO rated speed under load.

MILL ROTOR SPEED

A minimum rotor shaft speed of 2,200 rpm must be maintained. This speed is obtained when the tractor PTO operates at 540 or 1000 rpm. Any reduction of rotor shaft speed greatly reduces capacity.

To operate the mill at greatest capacity, set the tractor throttle at the PTO rated load speed (see tractor operator's manual). When the feed gate is opened and the mill causes the tractor rpm to operate below 540 or 1000 rpm, either lower the feed gate to obtain the tractor rated PTO speed, or increase tractor throttle setting.

OPERATING SEQUENCE

Position the auger feeder as described on page 9.

A minimum rotor shaft speed of 2,200 rpm must be maintained. This speed is obtained when the tractor PTO operates at 540 or 1000 rpm. Any reduction of rotor shaft speed greatly reduces capacity.

To operate the mill at greatest capacity, set the tractor throttle at the PTO rated load speed (see tractor operator's manual). When the feed gate is opened and the mill causes the tractor rpm to operate below 540 or 1000 rpm, either lower the feed gate to obtain the tractor rated PTO speed, or increase tractor throttle setting.

It is very important that the grinding and mixing cycle be performed in a definite pattern.

All supplements, especially vitamins and minerals, should be added at the concentrate hopper only. Vitamin and mineral additives can be damaged by the heat in the grinding unit if they are put in the main hopper.

When grinding and mixing for swine, follow the procedure described below:

1. Add approximately $\frac{2}{3}$ to $\frac{3}{4}$ of the protein supplement for the batch at the concentrate hopper.
2. Add the vitamin or antibiotic additives at the concentrate hopper.
3. Add approximately half the remaining protein supplement and continue the mixing cycle for about 2 minutes.
4. Continue mixing and add salt or other minerals and then the remainder of the protein material.
5. Disengage the tractor PTO and shut off tractor engine. Engage the hammer mill. Start tractor and engage the tractor PTO.
6. Engage the auger feeder and adjust the feed gate; add the proper amount of shelled corn or other grains.

After the grinding operation is completed, disengage tractor PTO and shut off tractor engine. Disengage the mill. Start tractor and engage tractor PTO and mix for 5 to 10 minutes.

Be sure to continue the mixing cycle when transporting with a load to avoid packing of the material. While operating, avoid tight turns which could damage the PTO shaft.

When grinding and mixing for cattle, either beef or dairy, and sheep, follow the procedure below:

Add all antibiotics and vitamins at the concentrate hopper and mix thoroughly.

1. Add the protein supplements at the concentrate hopper.

2. Add any vitamins or minerals about half way through the operation at the concentrate hopper.

3. Add the desired amount of grain through the mill.

4. When adding molasses, it is recommended that the dry form only be used. This form of molasses is easier to store and handle and will be mixed completely. To avoid sticking, add molasses after some dry materials have been ground.

5. If hay is to be added, feed it through the hammer mill last.

FILLING THE MIXING TANK

When grinding and mixing, be careful not to overfill the tank. However, if the tank is accidentally overfilled, it is equipped with a spring-release door on top of the tank to prevent damage to the unit.

The following feed weight chart is provided to serve as a guide when mixing different feeds and concentrates. Use it to determine how many pounds of supplements or other materials are necessary to give proper mix.

Pounds of Feed in Tank						
Index No. on Tank	Ground Shelled Corn 48 lb./bu.	Unground Shelled Corn 56 lb./bu.	Ground Ear Corn 44.8 lb./bu.	Ground Oats 22.4 lb./bu.	Ground Barley 35.2 lb./bu.	Ground Milo 48 lb./bu.
Full	3940	4600	3680	1840	2890	3940
7	3750	4350	3500	1750	2750	3750
6	3330	3850	3100	1550	2440	3330
5	2910	3350	2700	1350	2130	2910
4	2490	2850	2300	1150	1820	2490
3	2070	2350	1900	950	1510	2070
2	1650	1850	1500	750	1200	1650
1	1230	1350	1100	550	890	1230

NOTE: Above weights are average and are based on field measurements during grinding and before machine is moved. Actual weight of feed in tank depends on moisture content and fineness of grind.

TRANSPORTING



Before transporting the grinder-mixer, be sure to read and follow these instructions carefully:

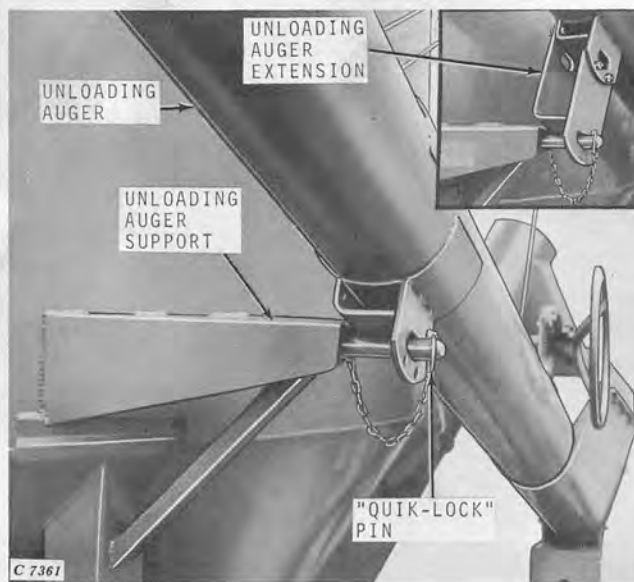
Check to be sure the hitch pin is locked in place with spring locking pin.

Check to be sure that both the auger feeder and unloading auger are disengaged and secured on their respective supports and that both "Quik-Lock" pins are in place.

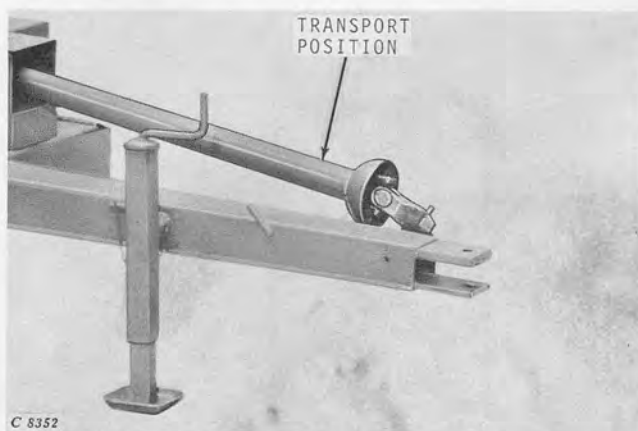
If the grinder-mixer is used with a tractor equipped with a Roll-Gard or cab, it is necessary to have an unloading auger support extension (extra equipment) to provide adequate clearance for the unloading auger (see inset in illustration next column). Use the bottom hole in the extension to fasten unloading auger to the auger support and secure with the "Quik-Lock" pin.

If the grinder-mixer does not have the unloading auger extension, slide the unloading auger onto the support and secure with "Quik-Lock" pin as illustrated.

When transporting a loaded grinder-mixer, disengage the hammer mill (see page 6) but continue the mixing operation to avoid packing of the material. While operating, avoid tight turns which could damage PTO shaft.



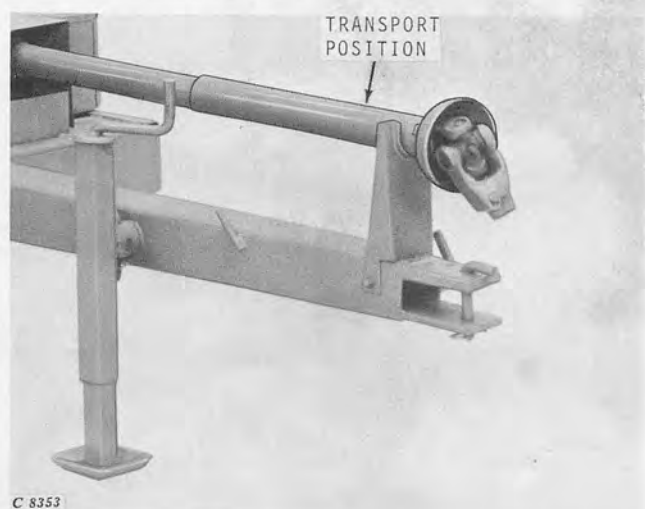
REGULAR 540 RPM PTO



When transporting grinder-mixer with the regular 540 rpm powershaft, always disconnect powershaft from tractor PTO.

IMPORTANT: Secure telescoping powershaft to support pin to prevent damage to telescoping powershaft.

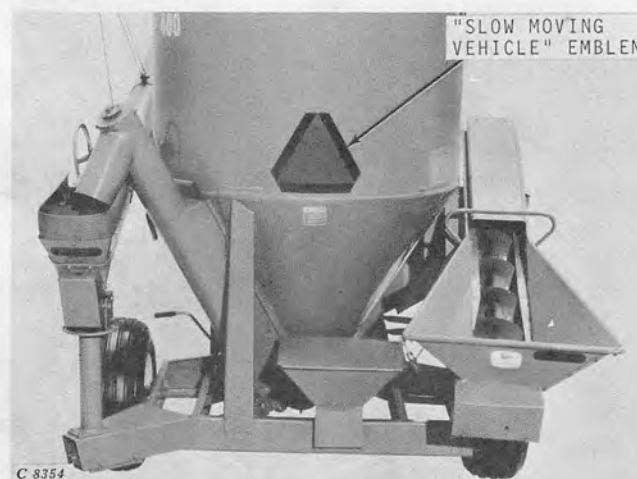
HEAVY-DUTY 540 OR 1000 RPM PTO



When transporting grinder-mixer with the heavy-duty 540 or 1000 rpm powershaft, always disconnect powershaft from tractor PTO.

IMPORTANT: Be sure to place PTO in the support and secure, to prevent damage to telescoping powershaft.

Always transport a loaded grinder-mixer at slow speed (10 mph or less) and be extra careful in hilly country.



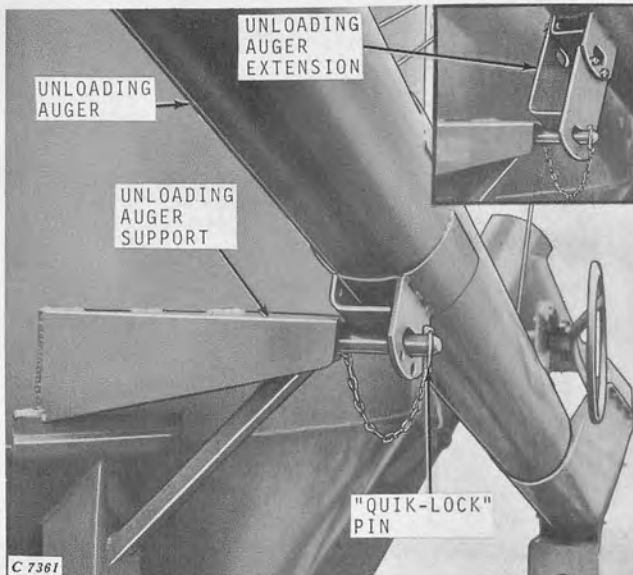
Your grinder-mixer is equipped with a "Slow Moving Vehicle" emblem for warning to the operators of vehicles approaching from the rear. Keep this emblem clean.

CAUTION: When transporting the grinder-mixer on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. In this regard, check your local governmental regulations. Various safety lights and devices are available from your John Deere dealer.

CAUTION: To avoid possible backward tip of the grinder-mixer with load in tank, always block rear of chassis before unhitching the grinder-mixer from the tractor. Do not remove the block while the grinder-mixer is unhitched from the tractor.

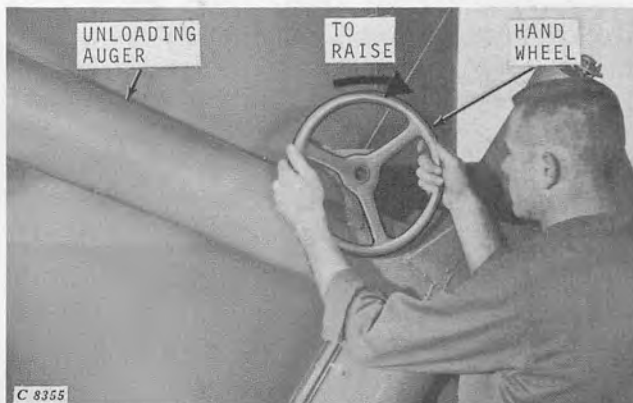
UNLOADING THE MIXING TANK

UNLOADING AUGER



Remove the "Quik-Lock" pin from the unloading auger support or unloading auger support extension.

Pivot the unloading auger toward the self-feeder or other container to be filled.



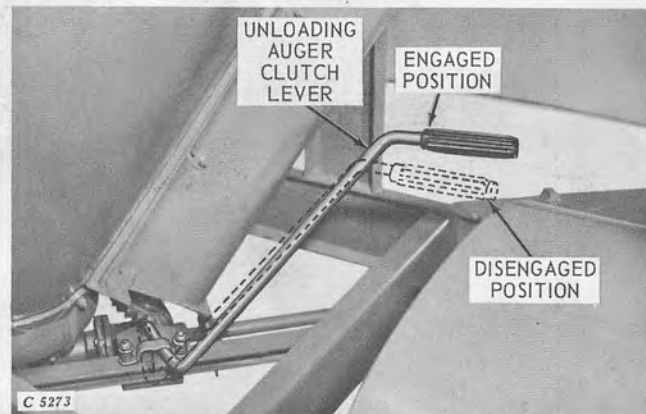
To raise the unloading auger, turn the hand wheel in a clockwise direction.



To lower the unloading auger, raise the stop and with one hand on the wheel, slowly lower the unloading auger. Release the stop when the unloading auger has reached the desired vertical location.

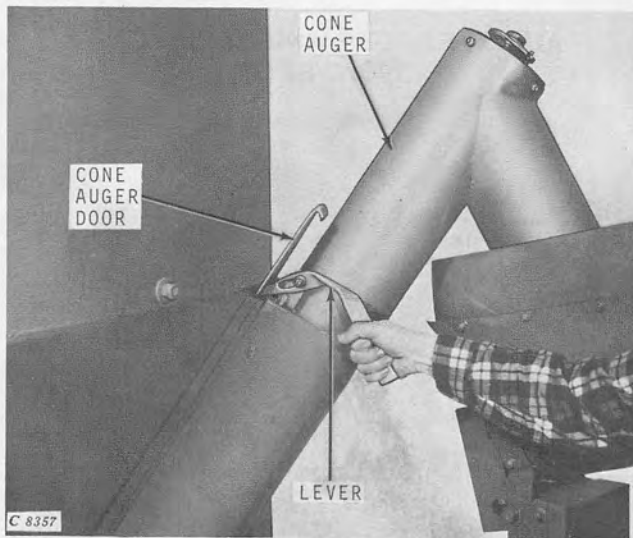
Swing the unloading auger around to the desired position. Lock it in this position by tightening the brake band with the hand nut.

Engage the tractor PTO lever with tractor at idle speed.



Engage the unloading auger clutch lever with tractor at idle speed, and increase tractor throttle setting to obtain PTO speed.

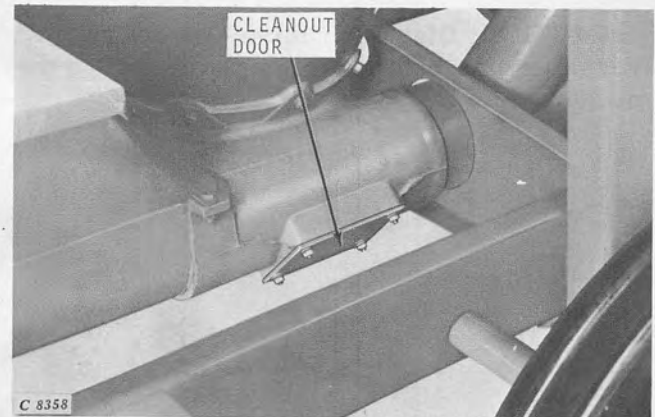
CONE AUGER DOOR



Raise the cone auger door with the lever to allow the feed to flow out of the mixing tank.

When the tank has been emptied, disengage the unloading auger clutch, lower the cone auger door, and raise or lower the unloading auger. Secure the unloading auger to its support with the "Quik-Lock" pin.

CLEANOUT DOOR



The mixing tank may be "cleaned out" or emptied into underground conveying systems or storage structures by using the cleanout door.

CAUTION: Disengage all drives and shut off tractor engine before removing or replacing cleanout door.

Remove nuts and lock washers from the four bolts in cleanout door. Remove cleanout door.

Engage the tractor PTO lever and allow the tank to empty.

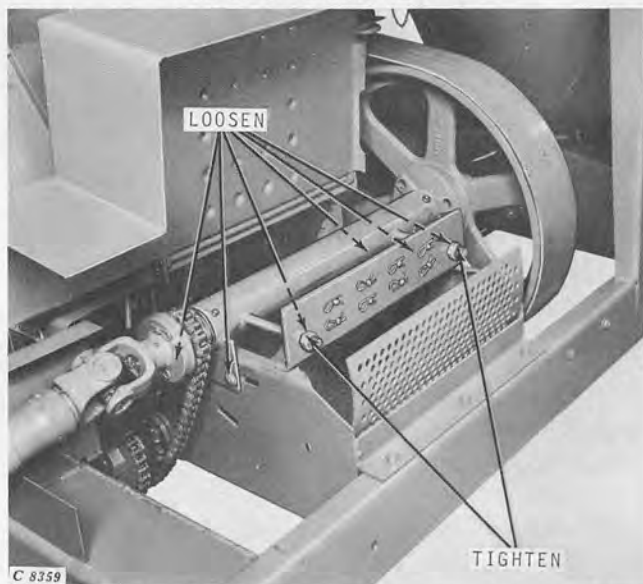
CAUTION: Keep hands, feet, and clothing away from cleanout door when it is open and machine is operating.

When the tank is empty, replace the cleanout door. Secure cleanout door with lock washers and nuts previously removed.

ADJUSTMENTS

CAUTION: Disengage all drives and shut off tractor engine before checking or adjusting the machine.

POLY-V DRIVE BELT

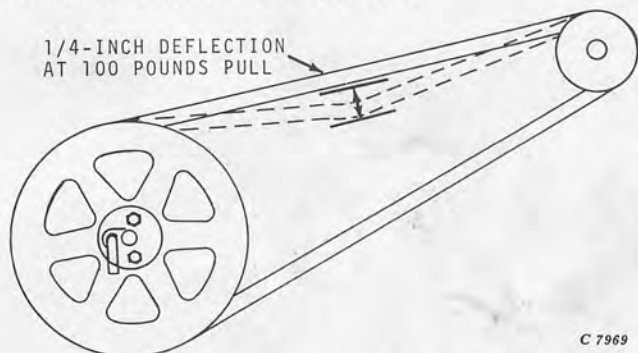


To tighten the Poly-V drive belt and align the drive sheaves, loosen the four nuts on the carriage bolts securing the drive shaft supports. Loosen the two inner nuts on the tightener bolts. Tighten the two nuts on the outside of the angle.

Check the alignment of the drive sheaves with a straight edge or string stretched along the side of the sheave near the center of the hub. Adjust the tightener nuts to align the sheaves within 1/32 inch.

IMPORTANT: Misalignment of drive sheaves may result in excessive belt wear.

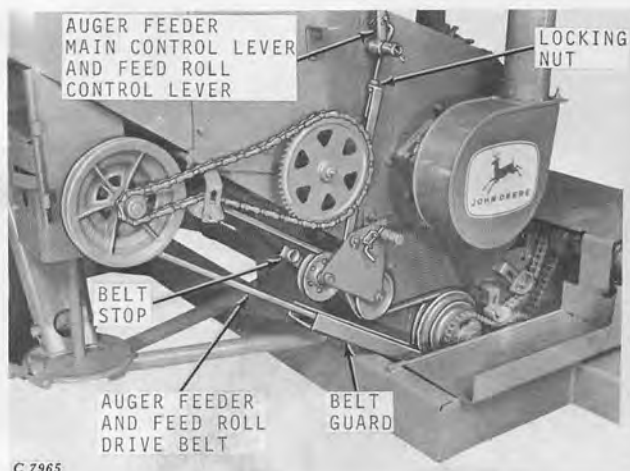
The belt is correctly tightened when a force of 100 pounds at the center of the longest span causes a deflection of 1/4 inch.



When the belt is properly tightened, tighten the four nuts on the carriage bolts securing the drive shaft to the drive shaft supports.

To replace the belt, see page 23.

AUGER FEEDER AND FEED ROLL DRIVE BELT



To tighten the auger feeder drive belt, disengage the auger feeder control lever.

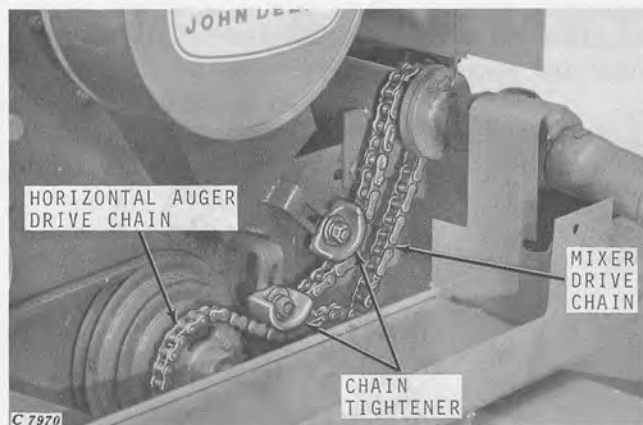
Loosen the locking nut on the feeder linkage lever and tighten the nut below the linkage lever.

The belt is properly adjusted when a pull of 15 pounds at the longest span of the belt results in a 3/4-inch deflection. When the belt is properly tightened, tighten the lock nut on the tightener linkage.

NOTE: If the auger feeder continues to run after the control lever on the mill has been disengaged, disengage all drives and shut off tractor engine. Adjust the belt stop so it forces the belt against the belt guard. To adjust belt stop, loosen nut on sheave and rotate stop down against belt until belt rests lightly against belt guard.

DRIVE CHAINS

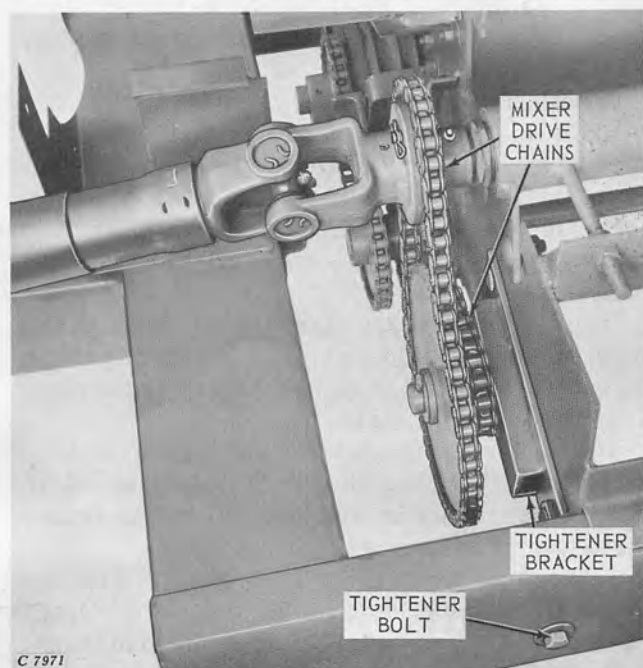
540 RPM OPERATION



The grinder-mixer drive chains are properly adjusted when moderate finger pressure deflects the chain 1/4 inch.

To adjust each chain, loosen the nut on the chain tightener and push it against the chain. Tighten nut.

1000 RPM OPERATION



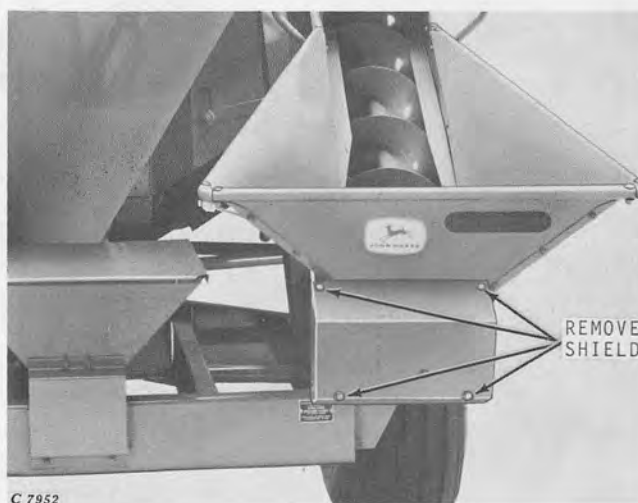
The chain is properly adjusted when moderate finger pressure along the longest span deflects the chain 1/4 inch.

To adjust the chain, loosen the two carriage bolts on the chain tightener bracket. Tighten the tightener bolt until the chain is properly adjusted.

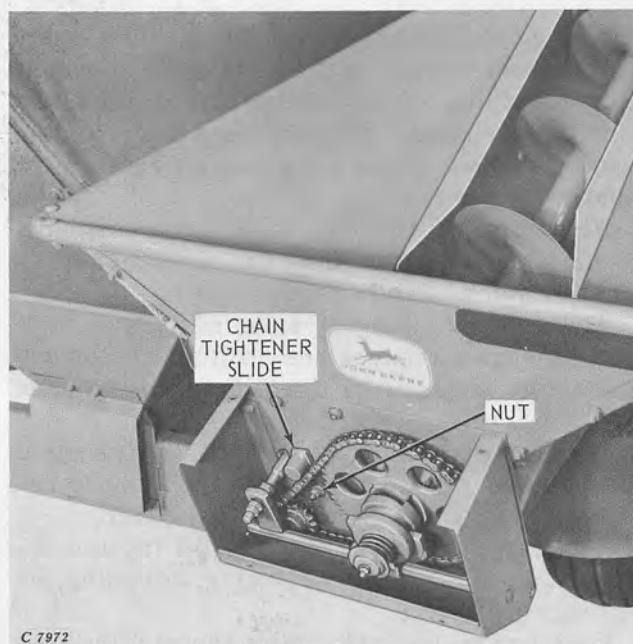
Retighten the two carriage bolts in the chain tightener bracket.

The horizontal drive chain is adjusted as shown for 540 rpm operation. See left column.

AUGER FEEDER DRIVE CHAIN AND CLUTCH CHAIN

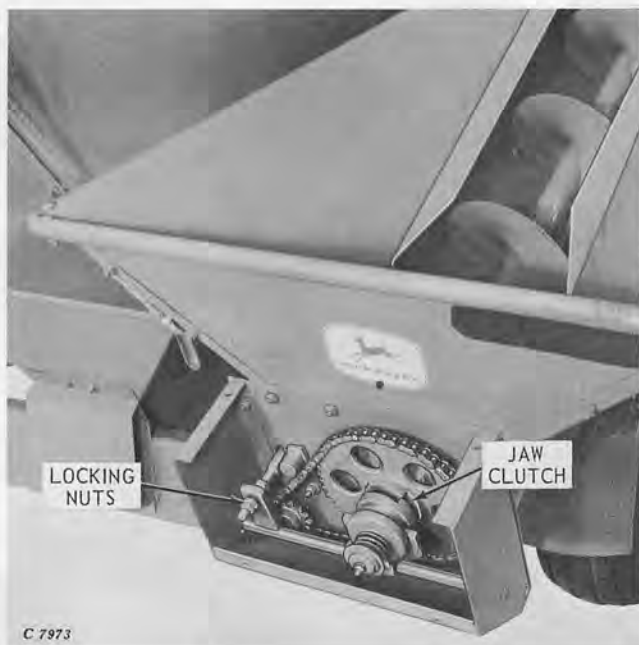


Remove the upper two screws, loosen the two lower screws on the auger feeder drive shield and remove the shield.



The chain is properly adjusted when moderate finger pressure deflects the chain 1/4 inch.

To tighten the chain, loosen the nut on the chain tightener slide and push the chain tightener down against the chain. Retighten the nut.

AUGER FEEDER CLUTCH

The auger feeder jaw clutch is properly adjusted if the two jaws are completely separated when the auger feeder is disengaged by the auxiliary control lever. See page 9.

To adjust the clutch, disengage the auxiliary control lever, loosen the two adjusting nuts, and pivot the fork clutch shaft away from the feeder hopper until the clutch jaws are completely disengaged. Then tighten the two locking nuts.

SAFETY SUGGESTIONS

The safety of the operator was one of the prime considerations in the minds of John Deere engineers when this grinder-mixer was designed. Shielding, simple adjustments, and other safety features were built into the grinder-mixer wherever possible. Nevertheless, ordinary caution must be taken when operating the grinder-mixer. There is no substitute for a careful and safety-minded operator.

High-strength bolts are used in the assembly of the grinder-mixer. If replacement is necessary, do not substitute regular bolts.

Always keep all safety shields in place.

Disengage all drives and shut off tractor engine before engaging or disengaging the hammer mill.

Disengage all drives, shut off tractor engine, and be sure that hammer mill has stopped rotating before opening screen access door.

Disengage all drives and shut off tractor engine before lubricating, servicing, adjusting, or unclogging machine.

Keep hands, feet and clothing away from power-driven parts.

Keep hands and feet away from cleanout door when it is open and machine is operating.

Never ride, or permit others to ride on the tractor drawbar or on the grinder-mixer.

Be sure the PTO and auger feeder spinner shields rotate freely at all times.

When transporting the grinder-mixer on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. In this regard check local governmental regulations. Various safety lights and devices are available from your John Deere dealer.

Your 400 Grinder-Mixer is equipped with a slow moving vehicle emblem for warning to the operators of vehicles approaching from the rear. Keep this emblem clean.

Regardless of the tractor used, always transport a loaded grinder-mixer at a slow speed (10 mph or less) and be extra careful when transporting in hilly country.

When transporting grinder-mixer with the powershaft disconnected from tractor PTO, always be sure the powershaft is secured in transport position to prevent damage to telescoping powershaft.

To avoid possible backward tip of the grinder-mixer with load in tank, always block rear of chassis before unhitching the grinder-mixer from the tractor. Do not remove the block while the grinder-mixer is unhitched from the tractor.



LUBRICATION

CAUTION: Disengage all drives and shut off tractor engine before lubricating the grinder-mixer.

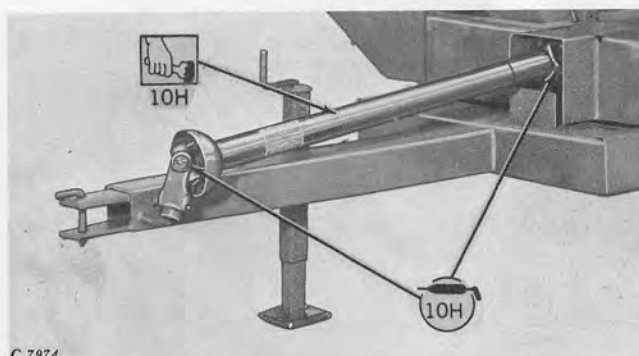
Lubrication intervals for the various working parts of your grinder-mixer are based on the hours of operation of the machine.

Grease fittings are provided at all points indicated in the illustrations that follow. Lubricate these parts with SAE multipurpose-type grease at the intervals indicated.

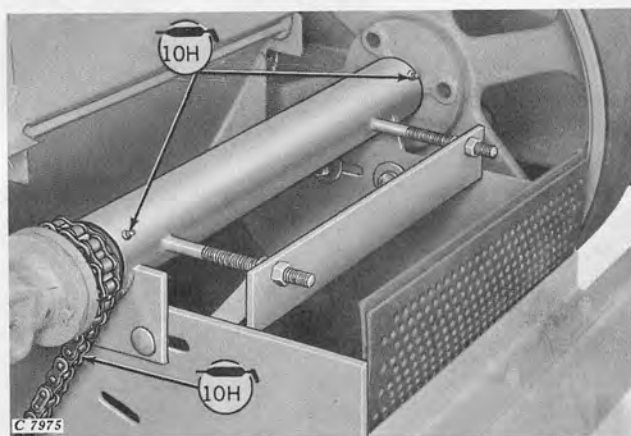
Clean the fittings thoroughly before using the grease gun. If any of the fittings are missing or damaged, replace them immediately.

The period recommended is based on normal conditions; severe or unusual conditions may require more frequent lubrication.

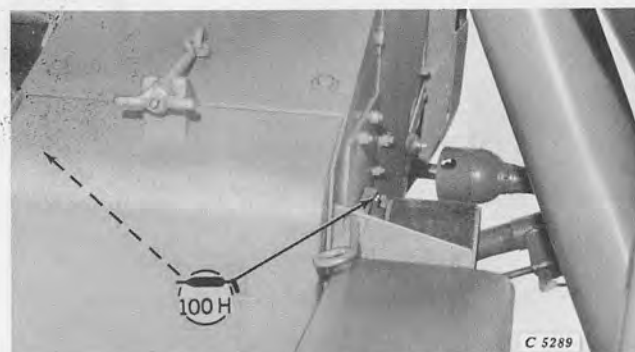
PTO SHAFT



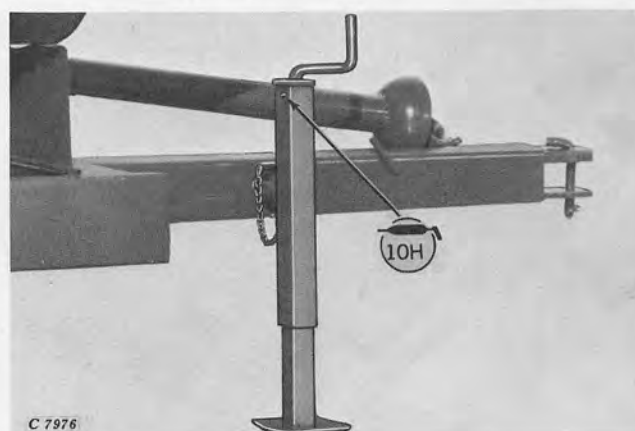
DRIVE SHAFT



ROTOR SHAFT



JACK STAND



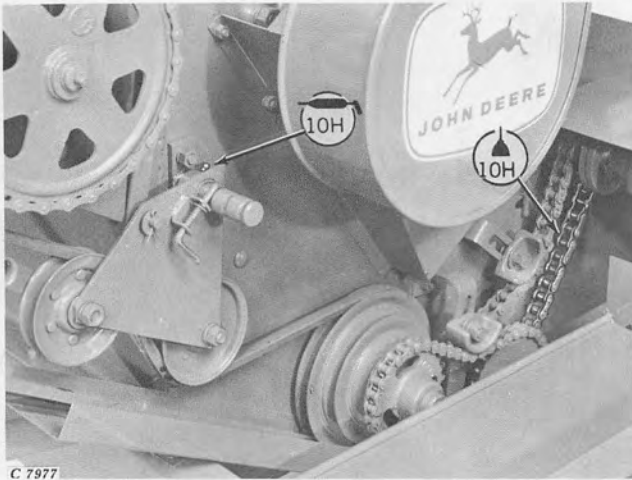
WHEEL BEARINGS

Under normal condition, check wheel bearings every 6 months. Repack bearings at least once a year.

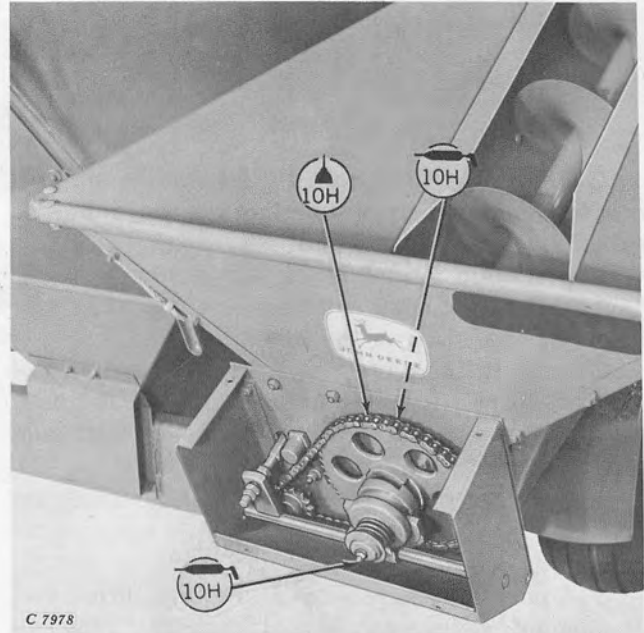
Symbols

	Lubricate every 10 hours of operation with SAE multipurpose-type grease.
	Lubricate every 100 hours of operation with SAE multipurpose-type grease or at least once a year.
	Lubricate every 10 hours of operation with SAE 10 oil.
	Inspect and lubricate, if necessary, every 10 hours of operation to insure free telescoping.

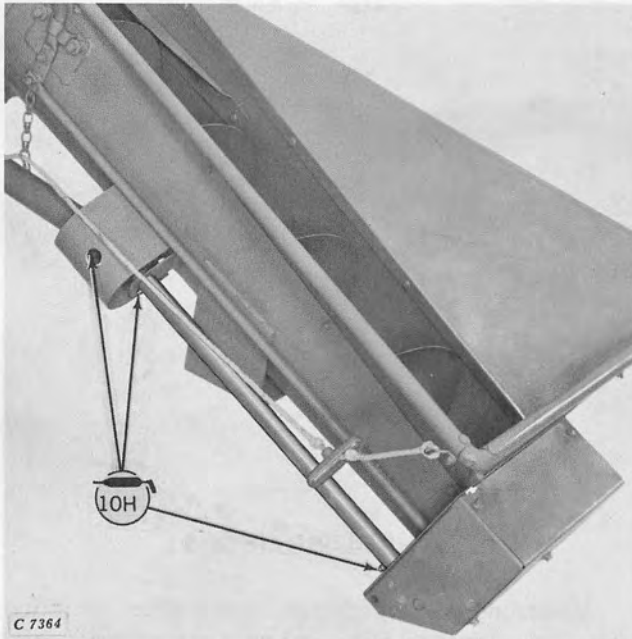
AUGER FEEDER



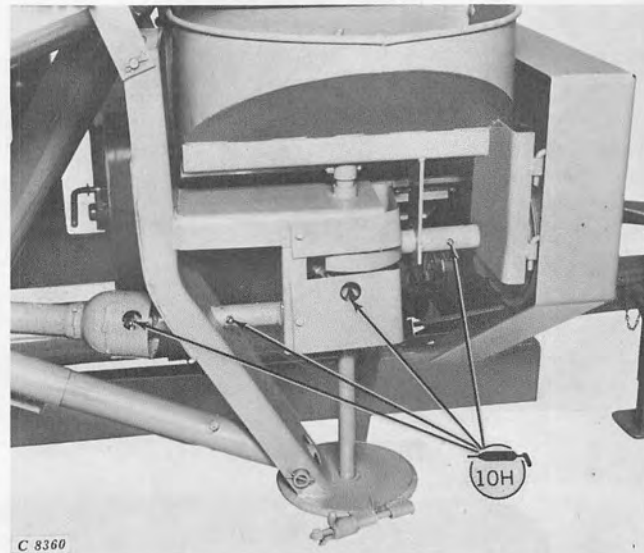
Clutch Plate Pivot and Chain



Auger Feeder Clutch Drive Shaft and Chain

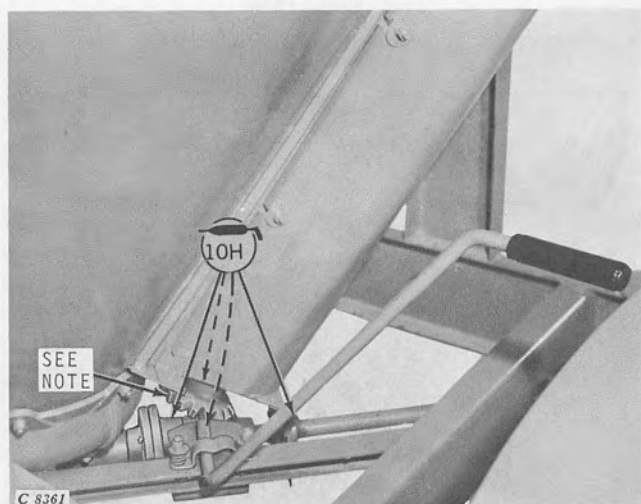


Auger Feeder PTO Shaft and Drive Shaft Housing



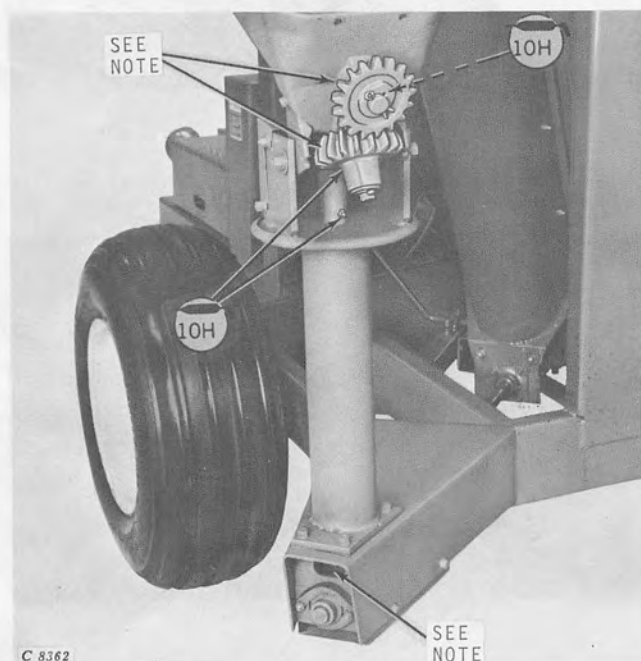
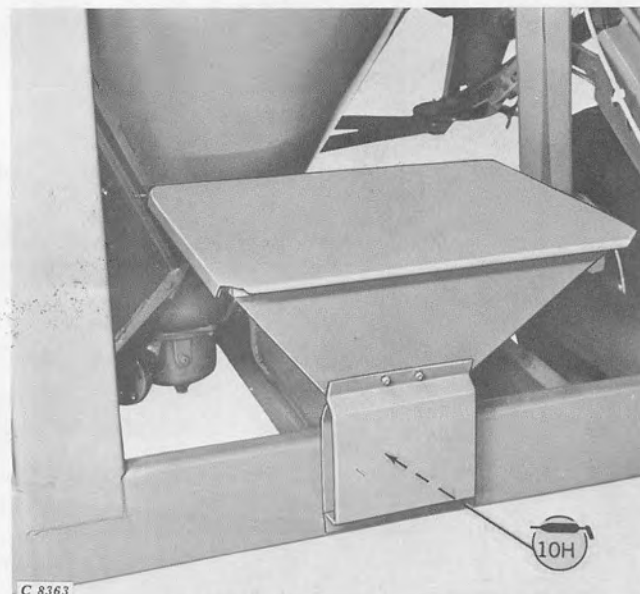
Feeder Drive

CONE AND UNLOADING AUGERS



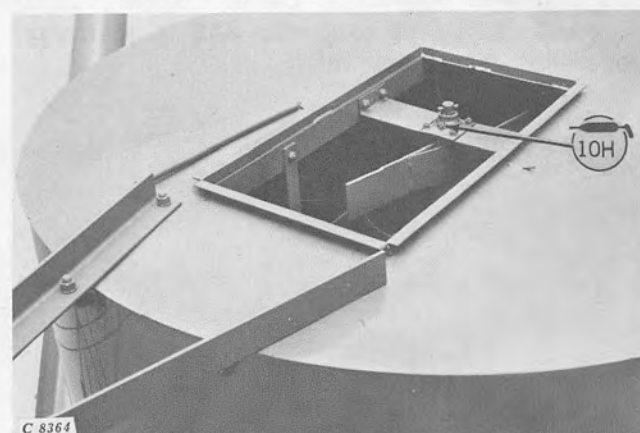
Shear Hub, Sliding Clutch Jaw and Bearings

HORIZONTAL AUGER BEARING



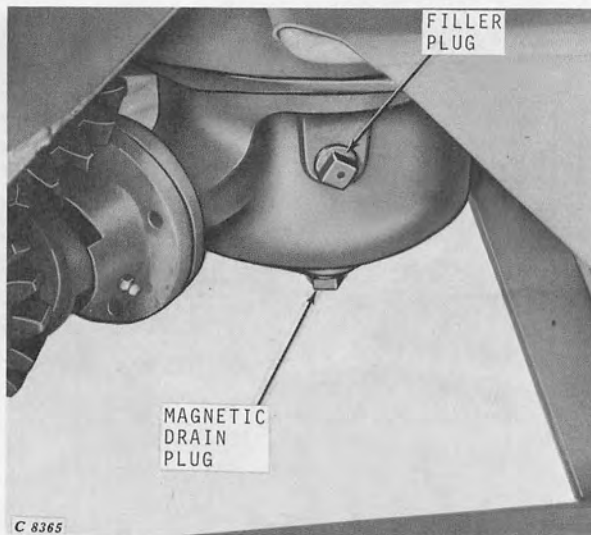
Idler Gear, Auger Shaft, and Drive Shaft

MIXING AUGER BEARING



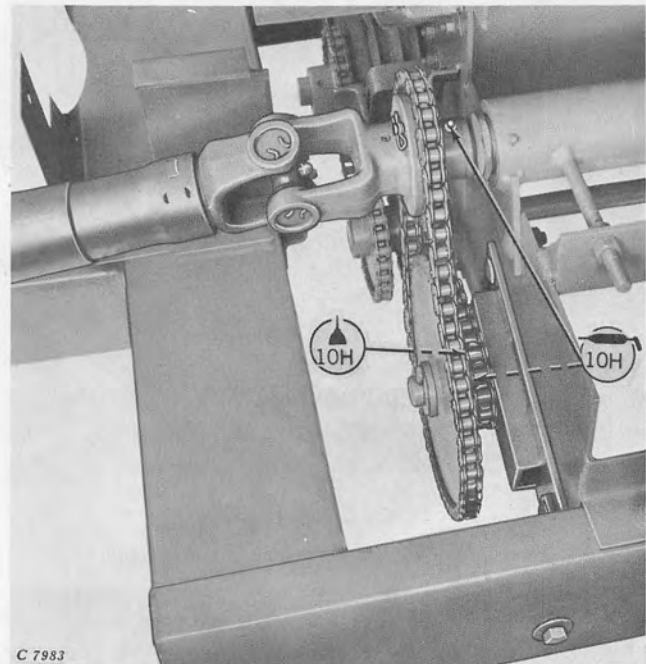
NOTE: Keep bevel gears well lubricated with SAE multipurpose-type grease.

GEAR CASE

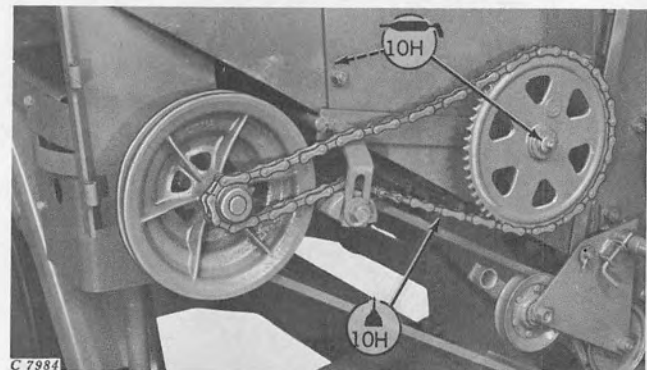


Check lubricant level at filler plug every 10 hours of operation. If necessary, add SAE 90 multipurpose-type gear lubricant. Drain every 100 hours of operation. Clean magnetic drain plug and refill gear case with SAE 90 multipurpose-type gear lubricant.

DRIVE SPROCKETS (1000 rpm)



FEED ROLL (Extra Equipment)





SERVICE

CAUTION: Disengage all drives and shut off tractor engine before servicing grinder-mixer.

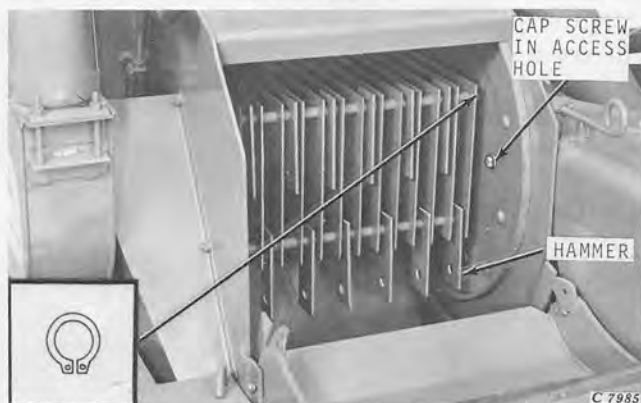
NOTE: High-strength bolts are used in the assembly of the grinder-mixer. If replacement is necessary, do not substitute regular bolts.

REVERSING OR REPLACING HAMMERS

CAUTION: Be sure hammer mill has stopped rotating before opening the screen access door.

There are four sets of hammers (total of 26 reversible hammers) in the rotor assembly. Always reverse or replace all four rows of hammers in order to maintain balance of the rotor.

Be careful to reinstall each row of hammers just as it was removed. Reverse or replace only one row at a time. Each row of hammers is in a different position on the hammer rods. Two opposite rods have 6 hammers each. The other two rods have 7 hammers each.



To reverse or replace the hammers, remove the cap screw, lock washer, and plain washer in the access hole. Remove the retaining ring (see inset) at the rear of the hammer rod.



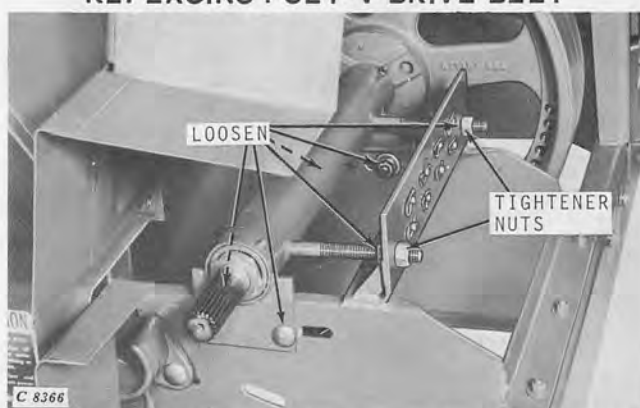
Turn the rotor until the hammer rod is aligned with the access hole. Slide rod out of rotor as-

sembly and catch each hammer as it falls.

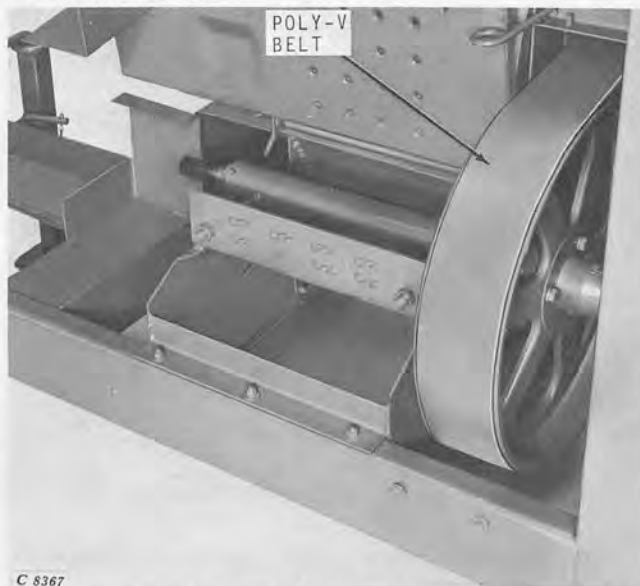
If the hammers are to be reversed to use one of the remaining sharp sides, replace each hammer on the rod in the same location from which it was removed. Be sure to install the retaining ring.

Repeat the above procedure for the remaining three sets of hammers.

REPLACING POLY-V DRIVE BELT



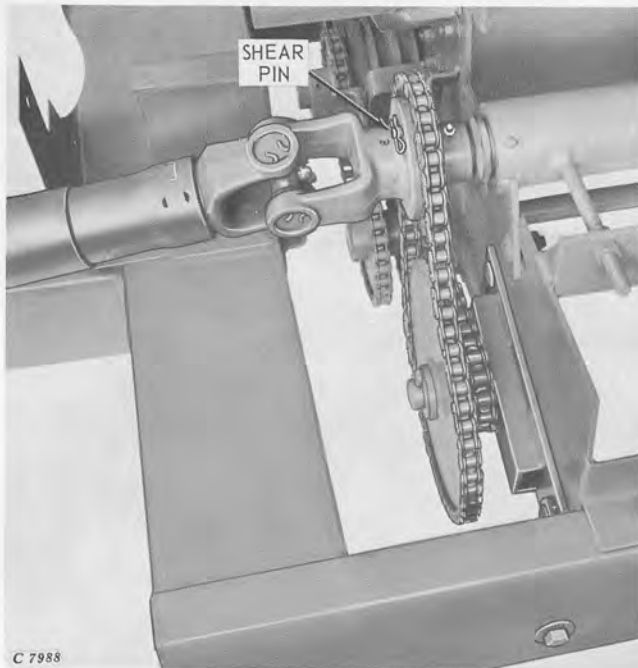
To replace the Poly-V drive belt, loosen the tightener nuts completely. Loosen the four nuts on the drive shaft brackets to drive shaft supports. Slide the drive shaft toward the mill as far as possible.



Remove the old belt and replace it with C17165 for 540 rpm operation or C17166 for 1000 rpm operation. Do not force the belt onto the sheaves. Tighten the belt as described on page 16.

REPLACING SHEAR PINS

MAIN DRIVE SHAFT (1000 rpm Operation)



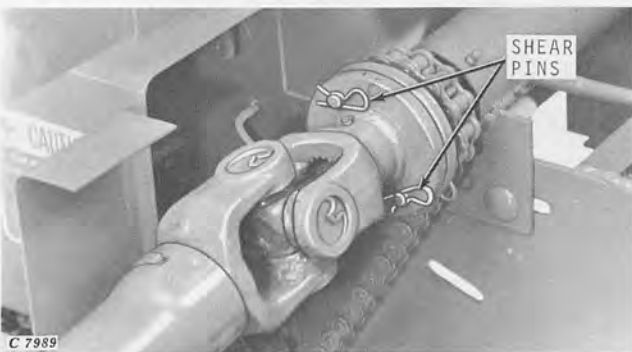
The grinder-mixer main drive is protected by a shear pin.

If the pin should shear, determine and correct the cause before replacing the shear pin.

To replace the shear pin, remove the broken pin from the hub and drive sprocket. Align the holes in the hub and drive sprocket and replace the pin.

Extra pins (C19354) are stored in a bracket under the main drive shield.

MAIN DRIVE SHAFT (540 rpm Operation)



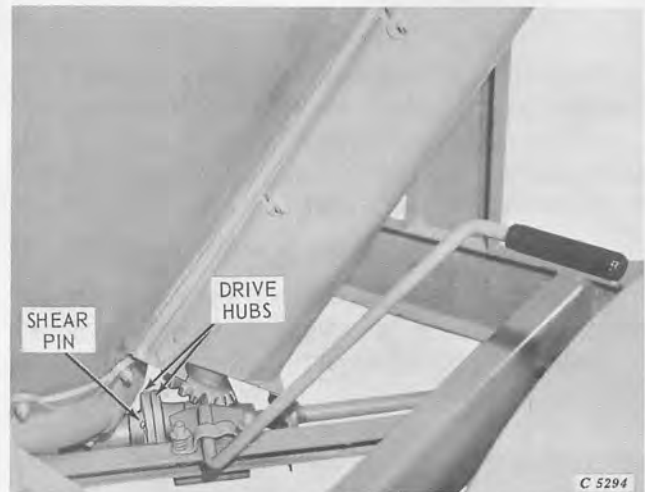
The grinder-mixer main drive is protected by two shear pins.

If either pin should shear, determine and correct the cause before replacing the shear pin.

To replace the shear pin, remove the broken pin from the shear hub. Align the holes in the shear hubs and replace the pin.

Extra shear pins (C19354) are stored in a bracket under the main drive shield.

CONE AND UNLOADING AUGER DRIVE



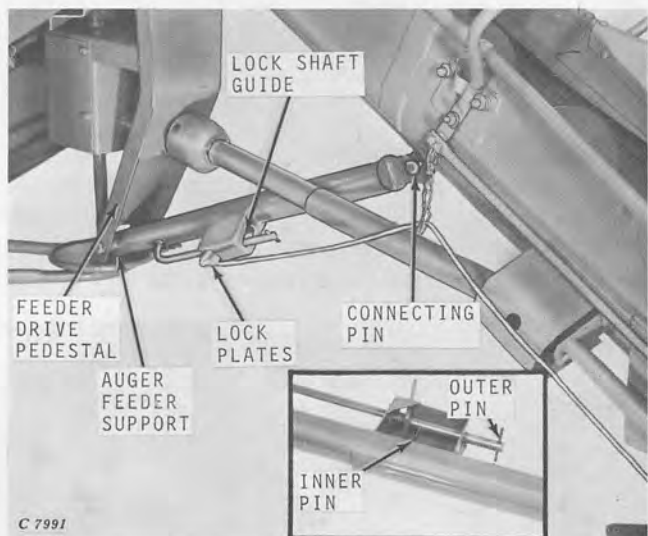
The cone and unloading auger drive is protected by a shear pin.

If the pin should shear, determine and correct the cause before replacing the shear pin.

To replace the shear pin, remove the broken pin from the hubs. Align the holes in the hubs and replace the pin.

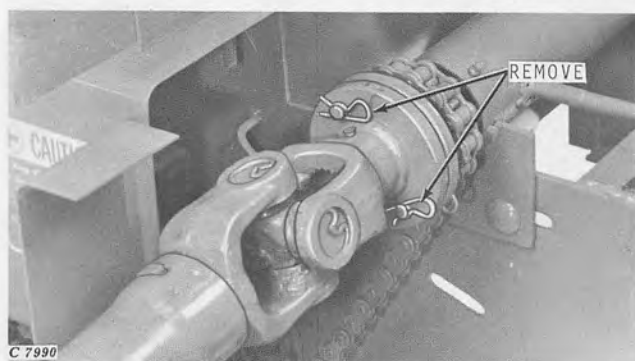
Extra pins (C19354) are stored in a bracket under the screen carrier cover.

AUGER FEEDER

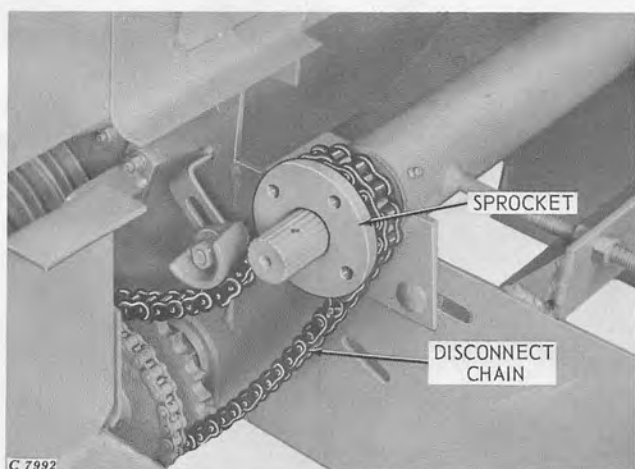


CAUTION: Never remove spring retaining pins from lock shaft should the auger feeder support become damaged. If the spring retaining pins are removed, the pressure of the compression spring inside the tube will be released and can cause personal injury.

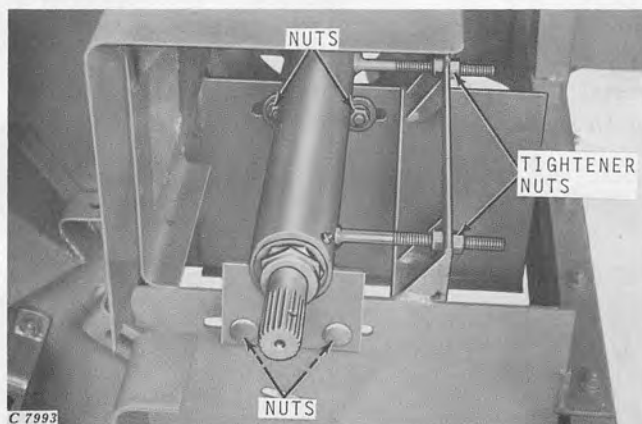
CONVERTING FROM 540 RPM TO 1000 RPM PTO OPERATION



Remove two spring locking pins and shear pins from shear hubs. Remove spring pin from U-joint and drive shaft. Remove PTO shaft from drive shaft.

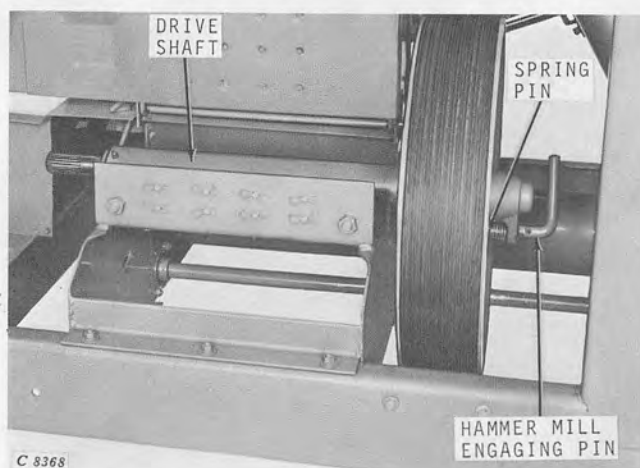


Disconnect the chain and remove the drive sprocket.



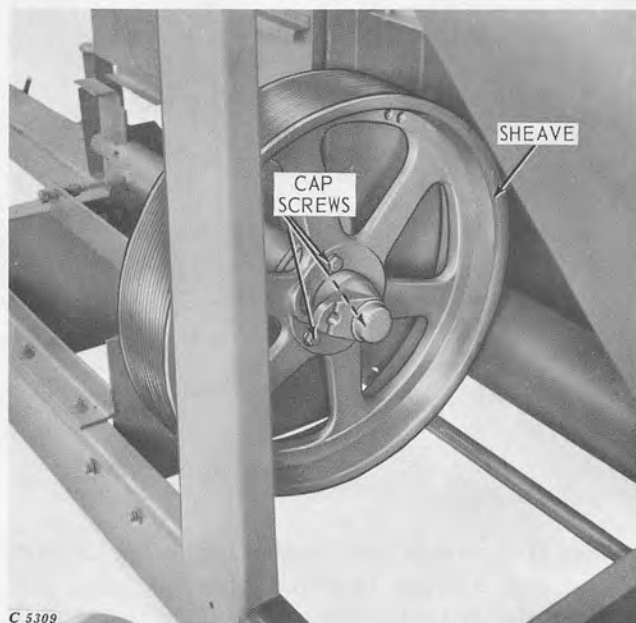
Loosen the four nuts securing the drive shaft to drive shaft support.

Loosen the two tightener nuts.

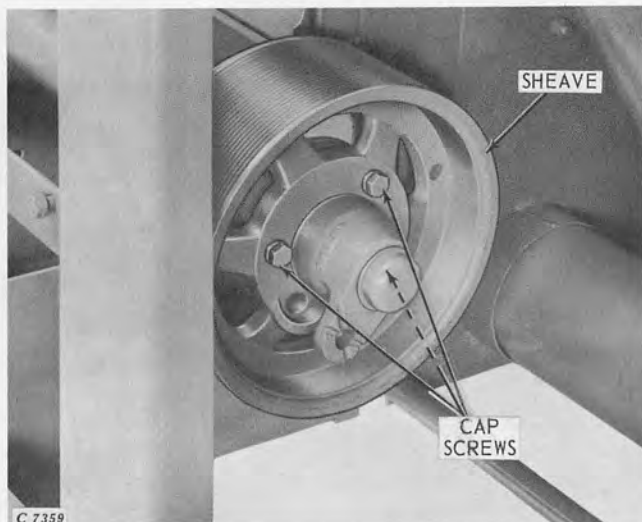


Slide the drive shaft in toward mill and remove the Poly-V belt. Do not force the belt off of the sheaves.

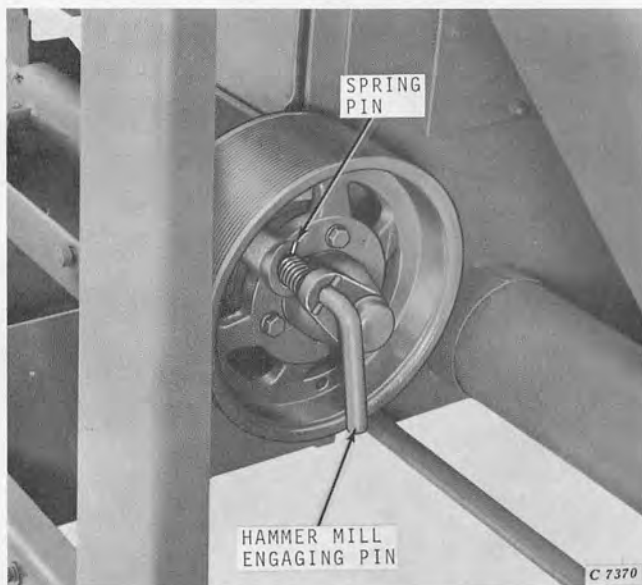
Remove the spring pin from the hammer mill engaging pin; remove the mill engaging pin and spring.



Remove the three 1/2 x 1-1/2-inch cap screws from the sheave and hub and remove the sheave.

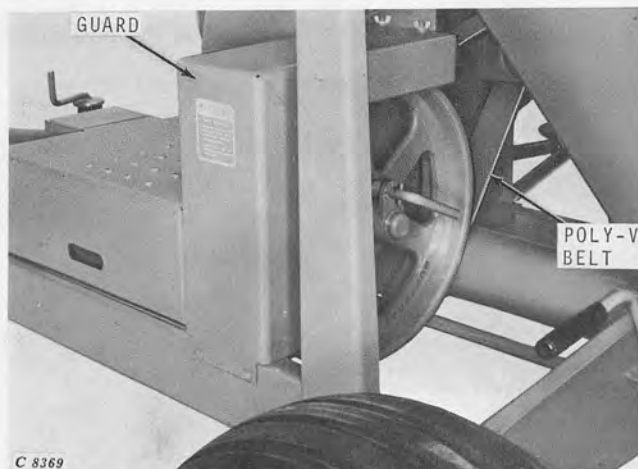


Install the 12-inch sheave (C17152) on the hub with three 1/2 x 1-1/2-inch cap screws previously removed. Be sure the holes for the hammer mill engaging pin in the sheave and hub are aligned.



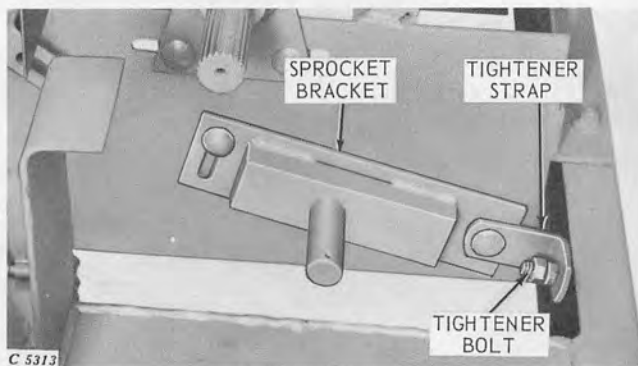
Install hammer mill engaging pin spring and spring pin so the handle of the engaging pin crosses the approximate center of hub when mill is engaged.

The spring pin should extend through one side only of the mill engaging pin as illustrated. Be sure the spring pin rotates the engaging pin out of the hub when the engaging pin handle is turned in a counterclockwise direction. The spring pin should engage the notch at the top of the cam when the mill pin is disengaged.



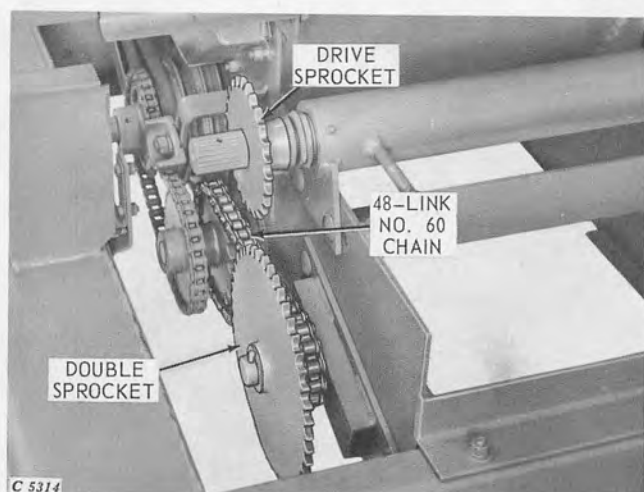
Install the Poly-V belt (C17166) and adjust it as described on page 16.

Install the Poly-V belt guard with hardware previously removed.



Install the 1000 rpm sprocket bracket with one 1/2 x 1-1/4-inch carriage bolt. Leave nut loose. Attach the tightener strap to the bracket with one 1/2 x 1-1/2-inch carriage bolt. Leave nut loose. Install the 1/2 x 3-inch tightener bolt through the main frame and tightener bracket.

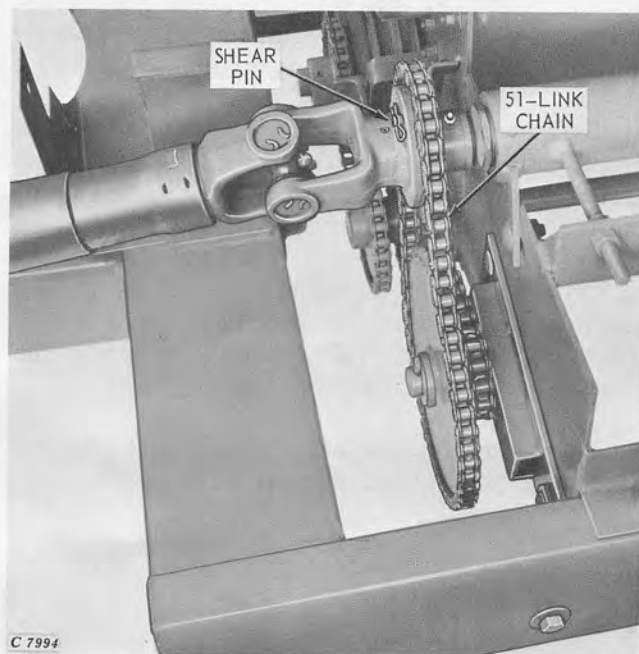
CONVERTING FROM 540 TO 1000 RPM PTO OPERATION—Continued



Install the double sprocket on the bracket with as many 1-5/32 x 2-inch plain washers as required to align sprocket with PTO drive sprocket, and one 1/4 x 1-3/4-inch spring pin.

Attach the 48-link (No. 60) chain as illustrated.

Slide the drive sprocket (C17396) onto the drive shaft with the hub facing inward.



Secure the implement half of the powershaft to the drive shaft with 1/4 x 2-inch spring pin.

Align the holes in the powershaft yoke and the sprocket and install one 3/8 x 1-5/16-inch shear pin and two spring locking pins.

Attach the 51-link (No. 50) chain to the sprocket as illustrated.

Adjust the chains so they are finger tight by turning the tightener bolt clockwise. Tighten the jam nut on the tightener bolt and the two carriage bolts on the sprocket bracket.

Install the 1000 rpm (21 splines) tractor half of the powershaft.

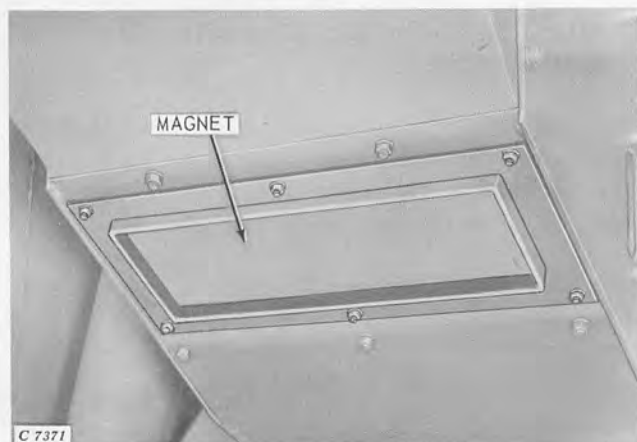
BE CAREFUL

Take Your Time—Not Your Life.



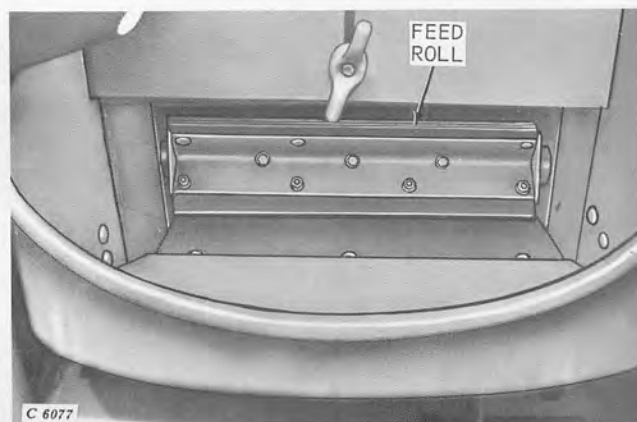
EXTRA EQUIPMENT

MAGNET



A permanent magnet can be installed in the hammer mill throat to remove tramp metal before it can be accidentally fed into the mill.

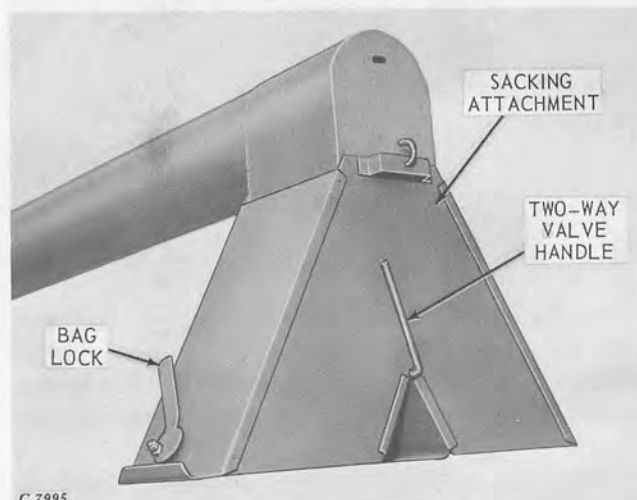
FEED ROLL



A feed roll attachment is available to improve the feeding of baled hay slices into the grinder-mixer. The feed roll fits across the bottom of the throat area at the inlet to the grinder. The rubber paddles help pull bale slices into the grinder.

Use of the feed roll with other crops also provides a smoother flow of material to the grinder-mixer.

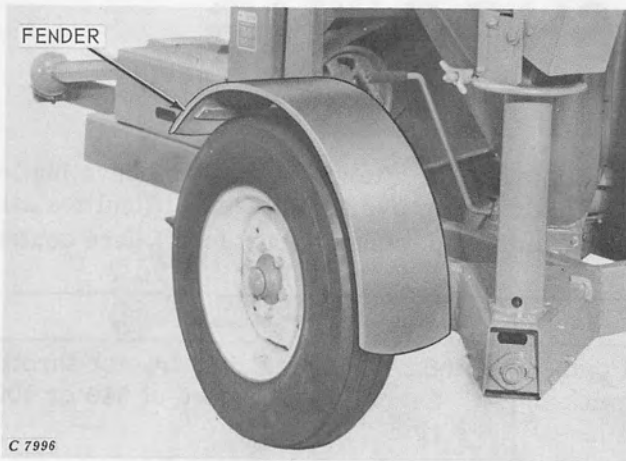
SACKING ATTACHMENT



A sacking attachment makes it convenient to sack ground feed. The attachment can accommodate two sacks and is equipped with a valve so the bags can be filled one at a time.

To fasten bag or sack to the sacking attachment, pull top of bag around either spout and fasten it over lip in center of spout. Then pull the other side of the bag up snug and fold excess of bag into lip on outside of the spout. Pull bag lock down to hold bag in position. Attach other bag in the same way. After the first bag is filled, move the two-way valve handle to route the ground feed into the second bag.

To remove either bag, raise bag lock, lift sack edges off lip and remove bag.

FENDERS

C 7996

Fenders are available to protect the grinder-mixer and following vehicles from mud, snow, etc. They are particularly useful if the grinder-mixer is transported often on public roads.

1000 RPM DRIVE

An attachment is available to convert a mill equipped for 540 rpm to 1000 rpm operation. See pages 25 through 27 for converting instructions.

UNLOADING AUGER SUPPORT EXTENSION

The unloading auger support extension is available for the grinder-mixer. The support extension is required when the grinder-mixer is transported by a tractor equipped with a cab or Roll-Gard. See page 45 for assembly instructions.



TROUBLE SHOOTING

The Grinder-Mixer should perform smoothly and efficiently. If, after following the operating instructions in this manual and checking the Grinder-Mixer for proper adjustment, difficulties still persist, use the following chart. If the trouble cannot be corrected, consult your John Deere dealer.

Problem	Possible Cause	Remedy
Mill has low capacity.	Mill rotor not turning at optimum speed of 2,200 rpm.	Before grinding, set tractor throttle to obtain PTO speed of 540 or 1000 rpm.
	Screen may be worn or screen holes worn out-of-round.	Turn screen around or replace if necessary.
	Mill drive belt slipping.	Adjust drive belt. See page 16.
	Hammers worn.	Turn hammer until all four edges are used. If necessary, replace worn hammers.
	Mill not level.	Operate mill level whenever possible.
Tractor engine speed falls below normal PTO operating speed while grinding.	Overfeeding.	Reduce flow of material to mill. See page 10.
Mill has low output; tractor rpm decreases and tractor engine operates with excessive strain.	Feed gate is raised too high.	Lower feed gate until tractor engine returns to rated PTO rpm. See pages 7 and 10.
Material bridges in tank.	High-moisture ear corn or hay being ground.	Grind high-moisture ear corn or hay last.
Loud noise as bale slice enters mill.	Bale slice too thick.	Feed thinner bale slice.
	If Grinder-Mixer is equipped with a feed roll, feed roll speed may be too fast.	Reduce speed of feed roll by changing belt on triple sheaves. See page 9.
	If Grinder-Mixer is equipped with a feed roll, feed roll may be set too high.	Lower feed roll. See page 8.
Feed roll will not draw hay slice into mill.	Feed roll too low.	Raise feed roll. See page 8.

TROUBLE SHOOTING—Continued

Problem	Possible Cause	Remedy
Auger feeder runs full but little or no grain is delivered to mill.	Auger feeder speed too low.	Increase speed of auger feeder. See Page 9.
Auger feeder stops with control lever on mill engaged.	Auxiliary clutch disengaged.	Engage auxiliary clutch. See page 9.
	Auger feeder jaw clutch out of adjustment.	Adjust auger feeder jaw clutch. See page 18.
	Auger feeder drive belt slipping.	Adjust auger feeder drive belt. See page 16.
Auger feeder continues to run when control lever on mill is disengaged.	Belt stop out of adjustment.	Adjust belt stop. See page 16.
Auger feeder drive belt will not stay on sheaves.	Idler not positioned properly on pivot.	Relocate idler. See page 9.
Poly-V drive belt squeals when mill starts or during grinding.	Poly-V drive belt too loose.	Tighten Poly-V drive belt. See page 16.
Poly-V belt does not stay in grooves.	Drive sheaves out of alignment.	Align sheave. See page 16.
Poly-V belt wears excessively.	Belt out of alignment.	Align belt. See page 16.
	Belt slipping.	Adjust belt. See page 16.
	Material lodged in belt.	Clean belt and avoid spilling material onto belt.
Mixing auger driven sprocket not in line with drive sprocket.	Bearing collar not locked on shaft.	Align drive and lock collar on bearing in direction of rotation. Tighten set screw in collar.
Mill runs but horizontal and mixing augers do not run.	Pin(s) sheared in drive.	Determine and correct cause of sheared pin. Replace shear pin. See page 24.
Horizontal and mixing augers run but unloading auger does not run when clutch is engaged.	Pin sheared in unloading auger clutch.	Determine and correct cause of sheared pin and replace shear pin. See page 24.
Unloading auger runs but does not unload feed.	Cone auger door closed.	Open cone auger door. See page 15.

Problem	Possible Cause	Remedy
Mill vibrates excessively while operating.	PTO shaft not properly aligned.	Be sure tractor axle and front of grinder-mixer frame are parallel. See page 6.
	PTO shaft bent.	Replace PTO shaft.
	Missing or broken hammers.	Replace hammers. See page 23.
Universal joint hard to telescope and hook up.	Shafts twisted due to overload.	Load as uniformly as possible and adjust belts to prevent jumping or slipping. Use heavy-duty 540 or 1000 rpm PTO when operating with more than 70 hp.
Excessive noise when turning with grinder-mixer in operation.	Excessive turning rate.	Avoid sharp turns.
Universal joints collapse together when turning.	Drawbar not adjusted properly.	Adjust drawbar.



ASSEMBLY

SHIPPING BUNDLES

The basic grinder-mixer may be equipped with 540 regular, 540 heavy-duty, or 1000 rpm PTO drive and plain hopper or auger feeder.

Optional Equipment

Bundle No.	Description
AC 15490	540 rpm PTO (regular)
BC 10532	540 rpm PTO with Support (heavy-duty)
AC 15866	3/16-Inch Diameter Hole Screen
C 17474	7/16-Inch Diameter Hole Screen
AC 15865	1/8-Inch Diameter Hole Screen
C 19605	1/4-Inch Diameter Hole Screen
C 19606	5/16-Inch Diameter Hole Screen
C 17184	3/8-Inch Diameter Hole Screen
C 17185	1/2-Inch Diameter Hole Screen
C 17186	5/8-Inch Diameter Hole Screen
C 17187	3/4-Inch Diameter Hole Screen
C 17188	1-Inch Diameter Hole Screen
C 17189	1-1/4-Inch Diameter Hole Screen
C 17190	1-1/2-Inch Diameter Hole Screen
AC 14813	16 - 6-Inch Disk Wheel with Tire and Tube (2 used)
BC 10489	Disk Wheel with 11.00-15, 8-Ply Implement Tire (for high flotation) (2 used)
JD 1091	15 - 6-Inch Demountable Disk Wheel with Drop Center Rim (2 used)
JD 1986	16 - 6-Inch Disk Wheel (1-1/8-Inch Offset) (2 used)

Extra Equipment

Bundle No.	Description
AC 15275	Magnet
BC 10127	Sacking Attachment
BC 10129	Fenders and Supports
BC 10487	1000 rpm PTO Drive Parts
C 17512	Plain Hopper
BC 10470	Unloading Auger Support Extension
BC 10486	Feed Roll for Plain Hopper
BC 10488	Feed Roll for Auger Feeder
BC 10459}	Feeder Assembly (to convert from plain hopper to auger feeder)
AC 15531}	

BOLT AND NUT TORQUE SPECIFICATIONS

High-strength bolts are used in this factory-assembled grinder mixer. If replacement is necessary, do not substitute regular bolts.

High-strength bolts are provided for assembly of extra equipment. Unless otherwise instructed, tighten all bolts at the time of assembly according to the torque chart below.



C 8370

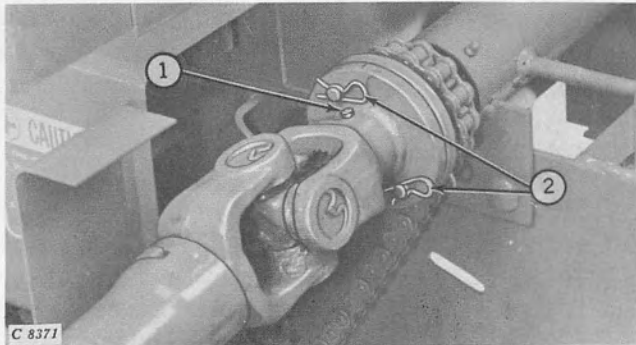
Mark on Bolt Head Indicating High-Strength

Size of Nut or Bolt Diameter	Recommended Setting—Ft.-Lbs High-Strength
1/4	10
5/16	20
3/8	35
7/16	55
1/2	85
9/16	130
5/8	170
3/4	300

The 400 Grinder-Mixer is completely factory-assembled except for 540 regular or 540 heavy-duty rpm PTO and the extra equipment items shown in this section.

CAUTION: Disengage all drives and shut off tractor engine before assembly.

INSTALLING 540 RPM PTO
(Regular 540 or Heavy-Duty 540)

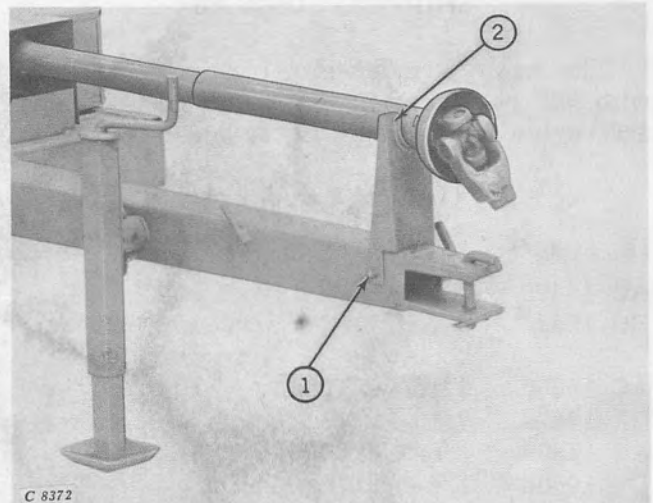


1. Slide the implement half of the powershaft onto the splined end of the drive shaft and secure with 1/4 x 2-inch spring pin.

2. Align the holes in the powershaft yoke and the drive shaft yoke and install two shear pins. Secure with four spring locking pins.

3. (Not illustrated.) Install the tractor half of the PTO on the powershaft.

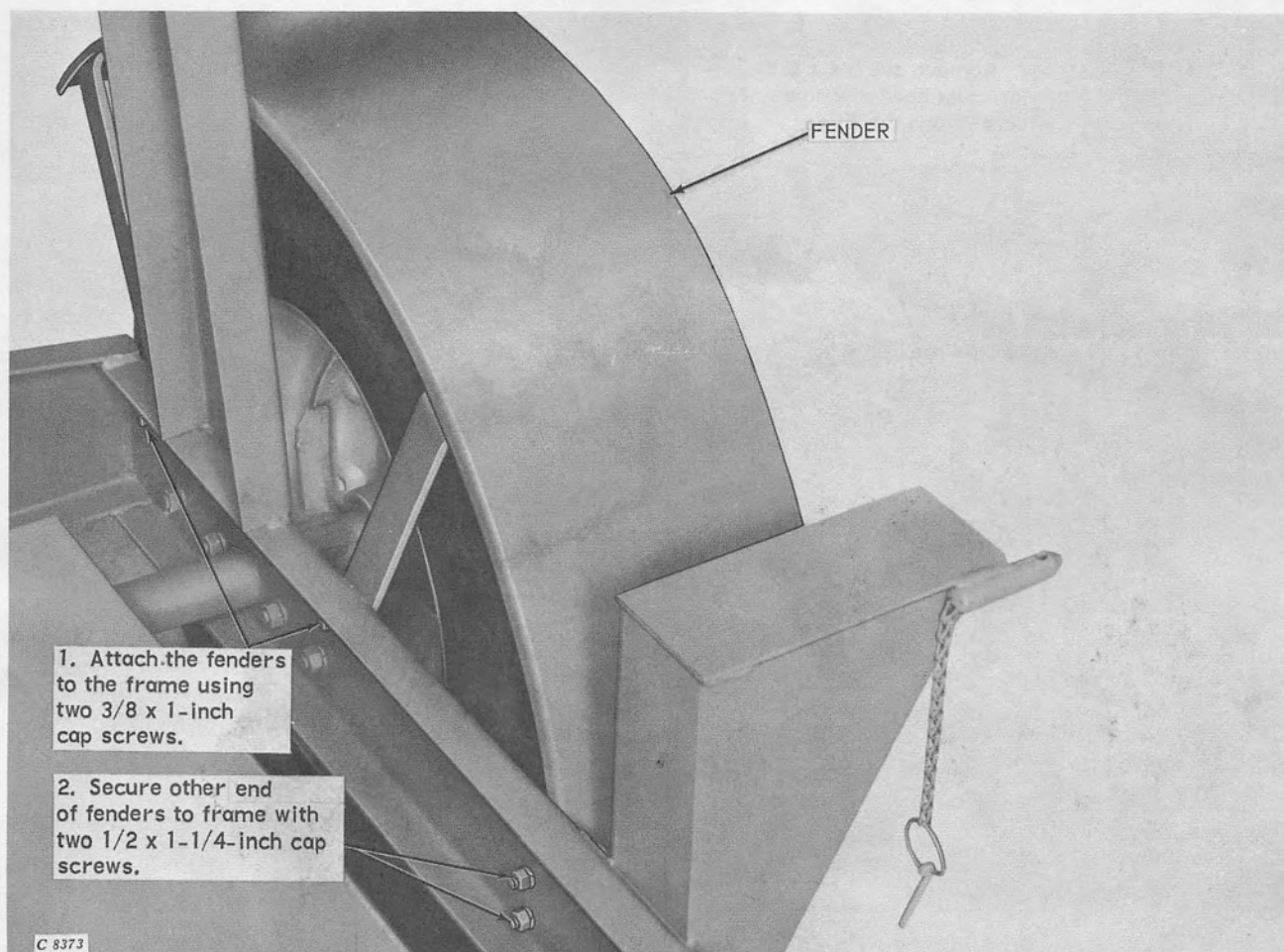
PTO SUPPORT FOR HEAVY-DUTY 540 RPM ONLY



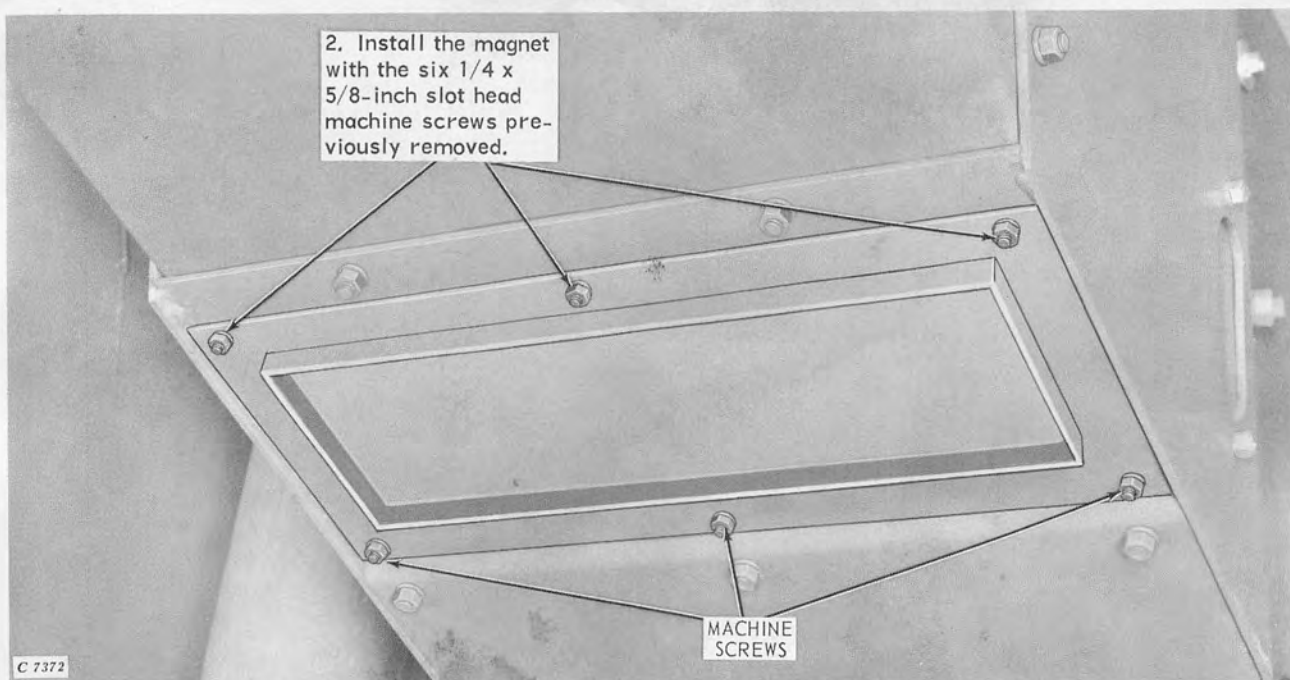
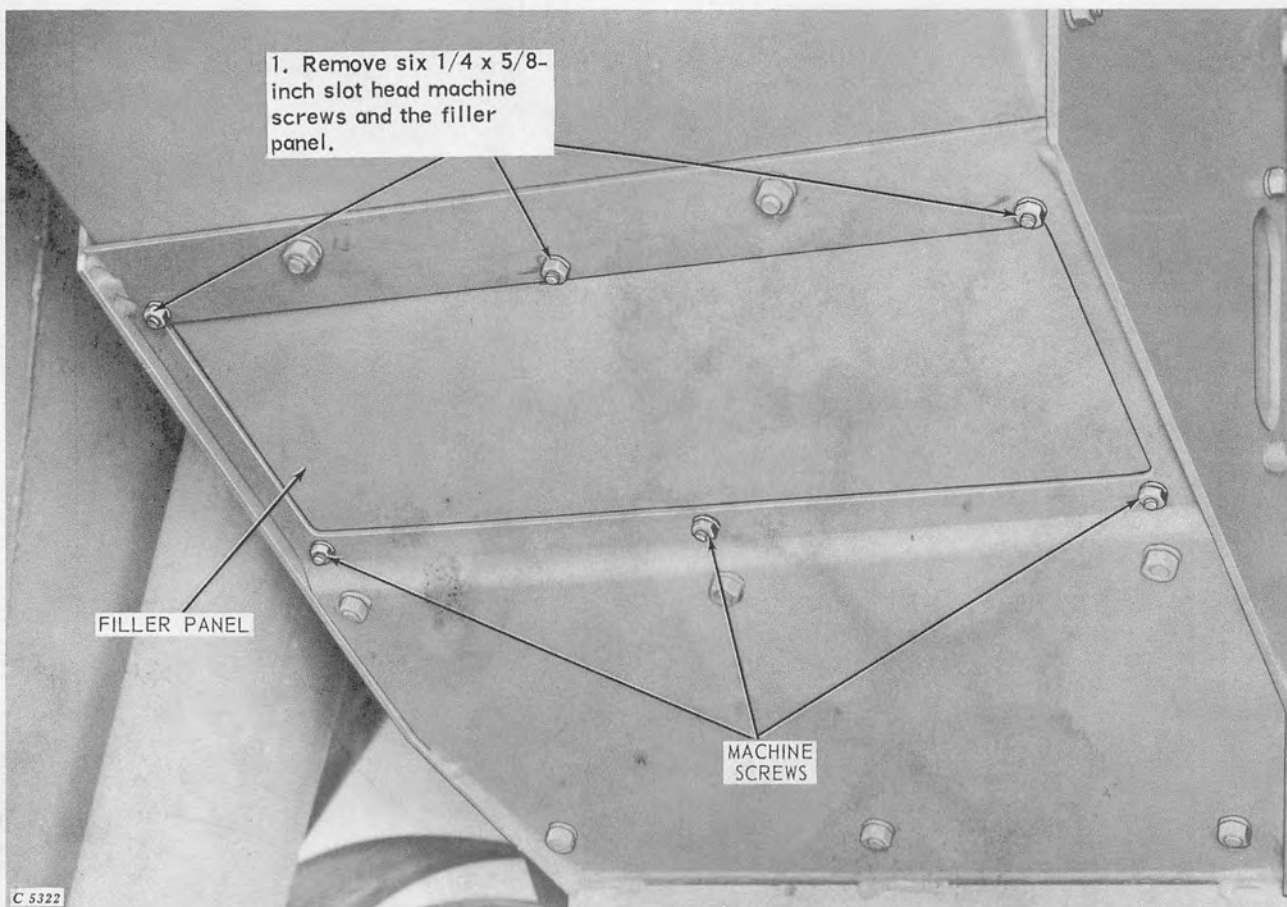
1. Attach PTO support to hitch with one 3/8 x 5-inch cap screw with special lock nut.

2. Position PTO shaft on PTO support.

FENDERS

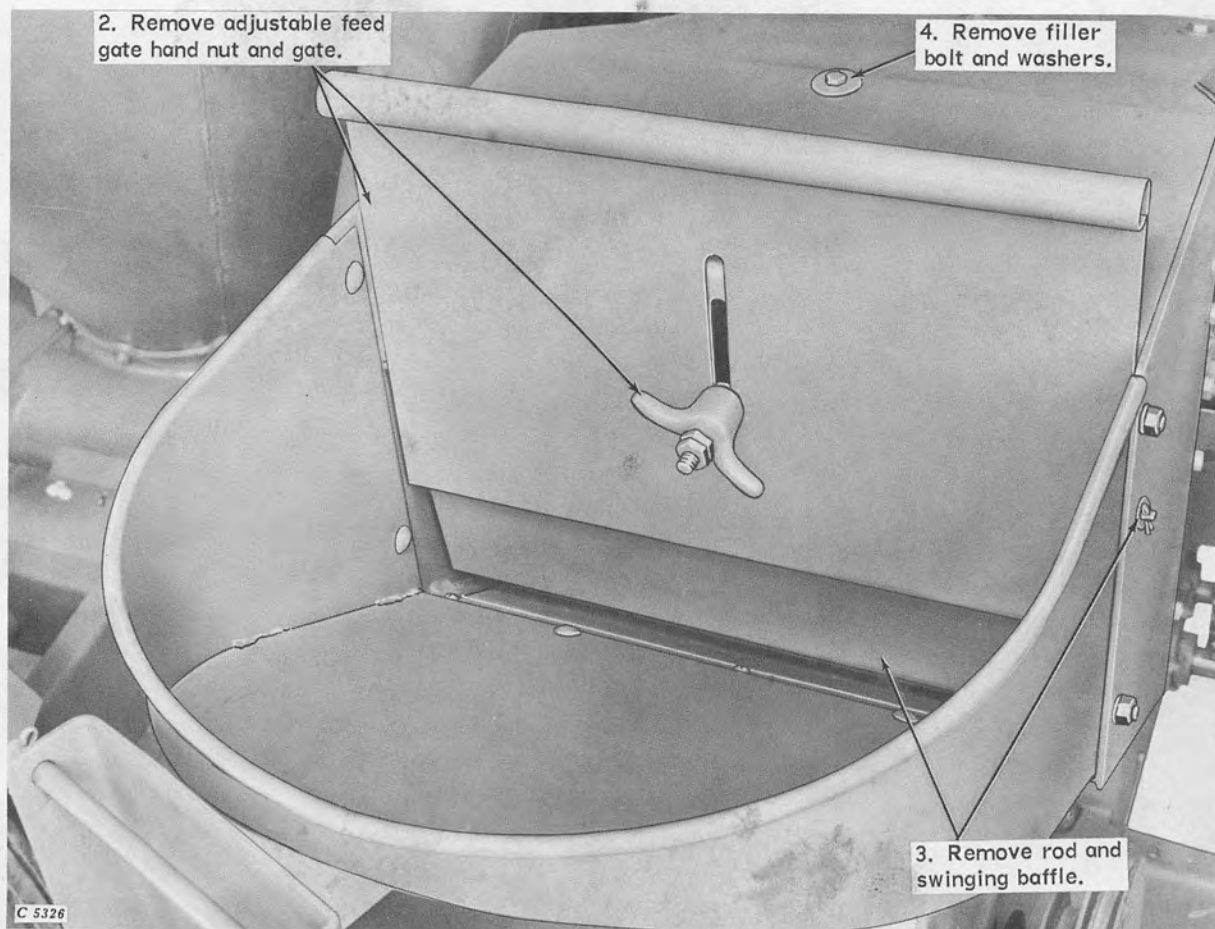
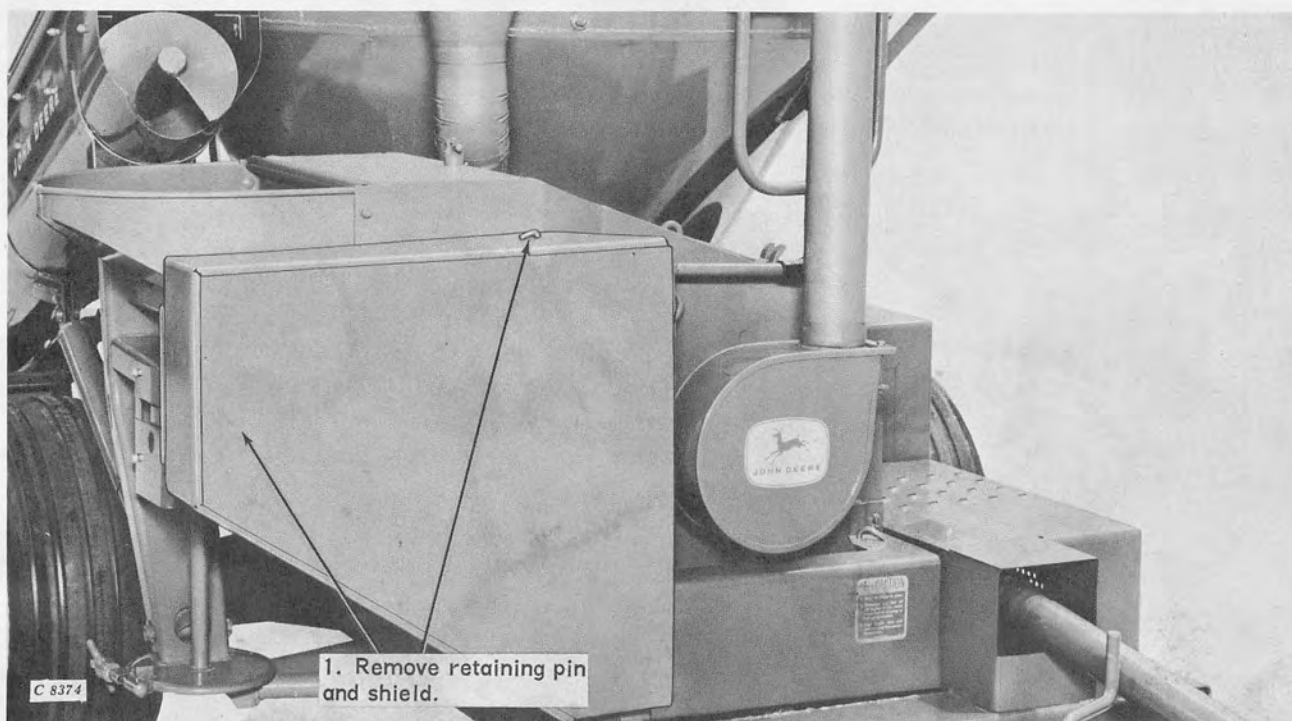


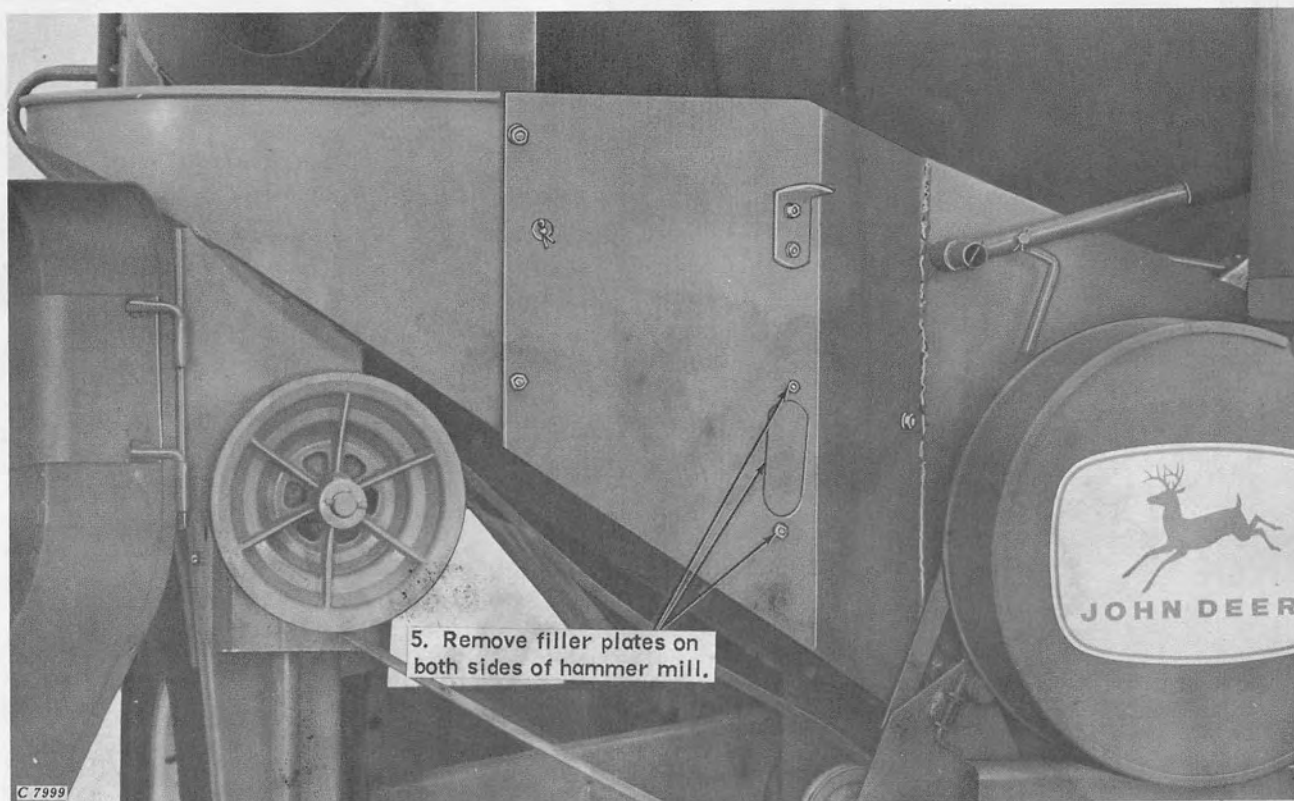
MAGNET



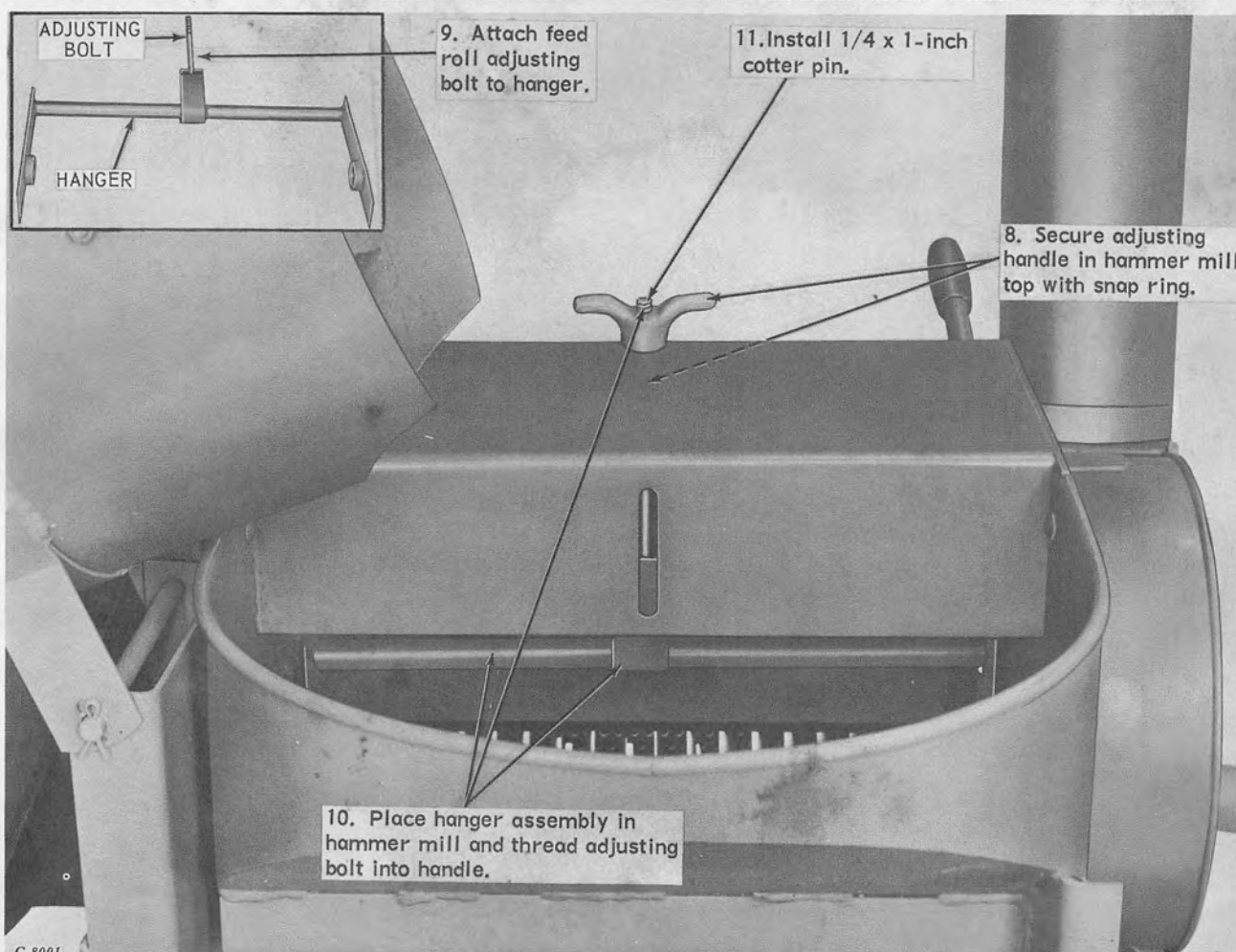
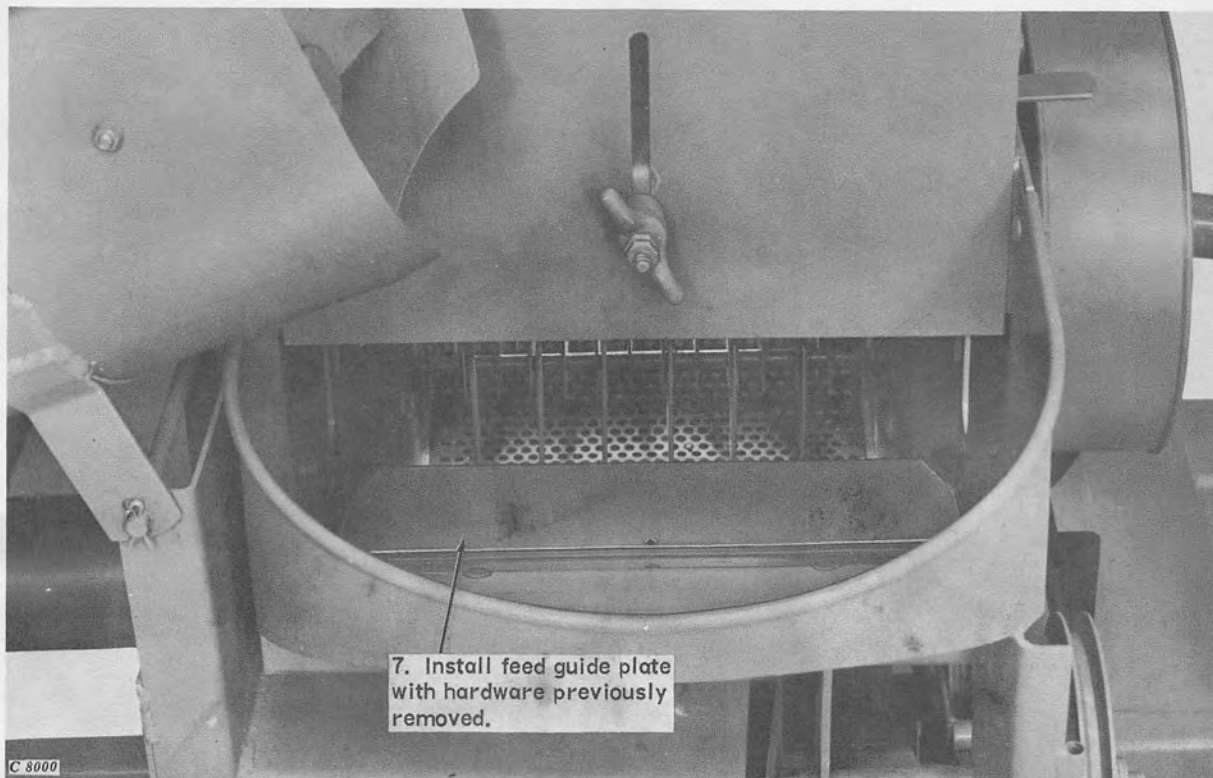
NOTE: Attach magnet to outside of mill slope sheet.

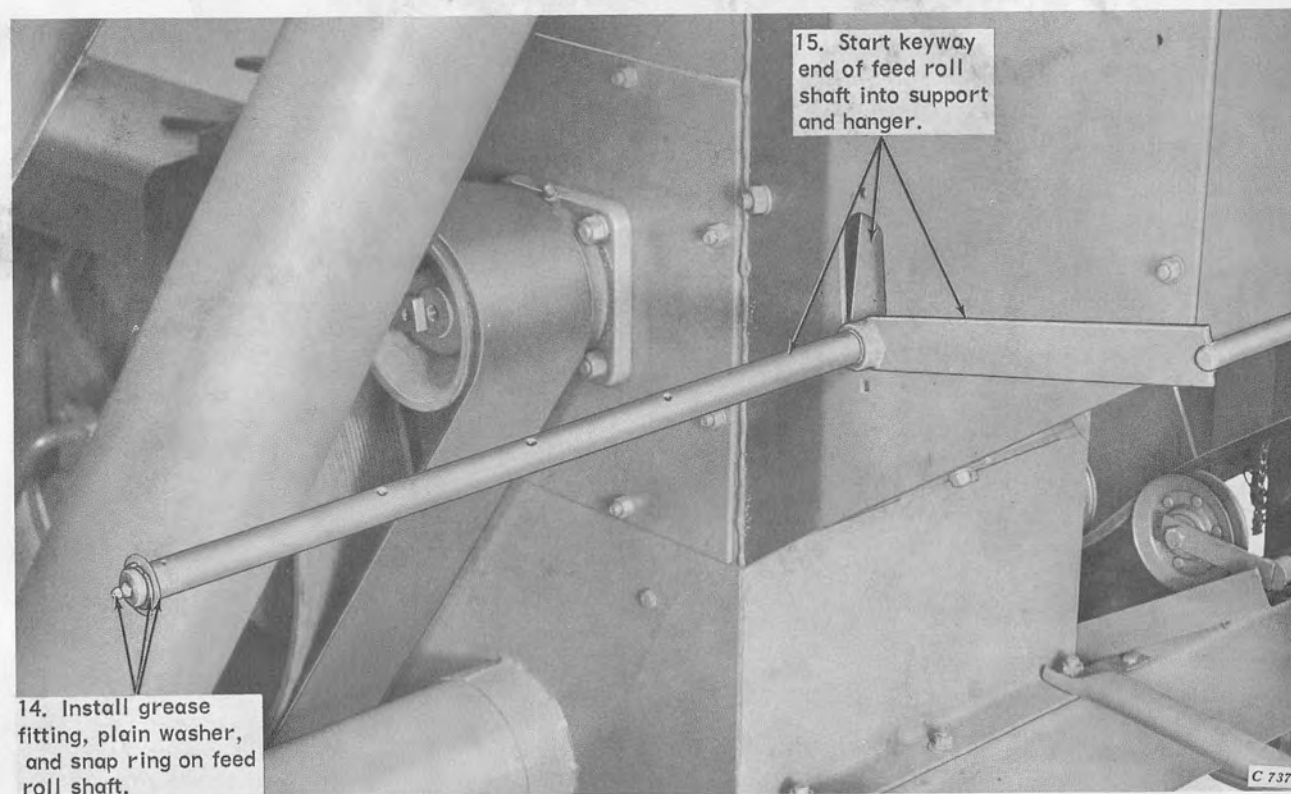
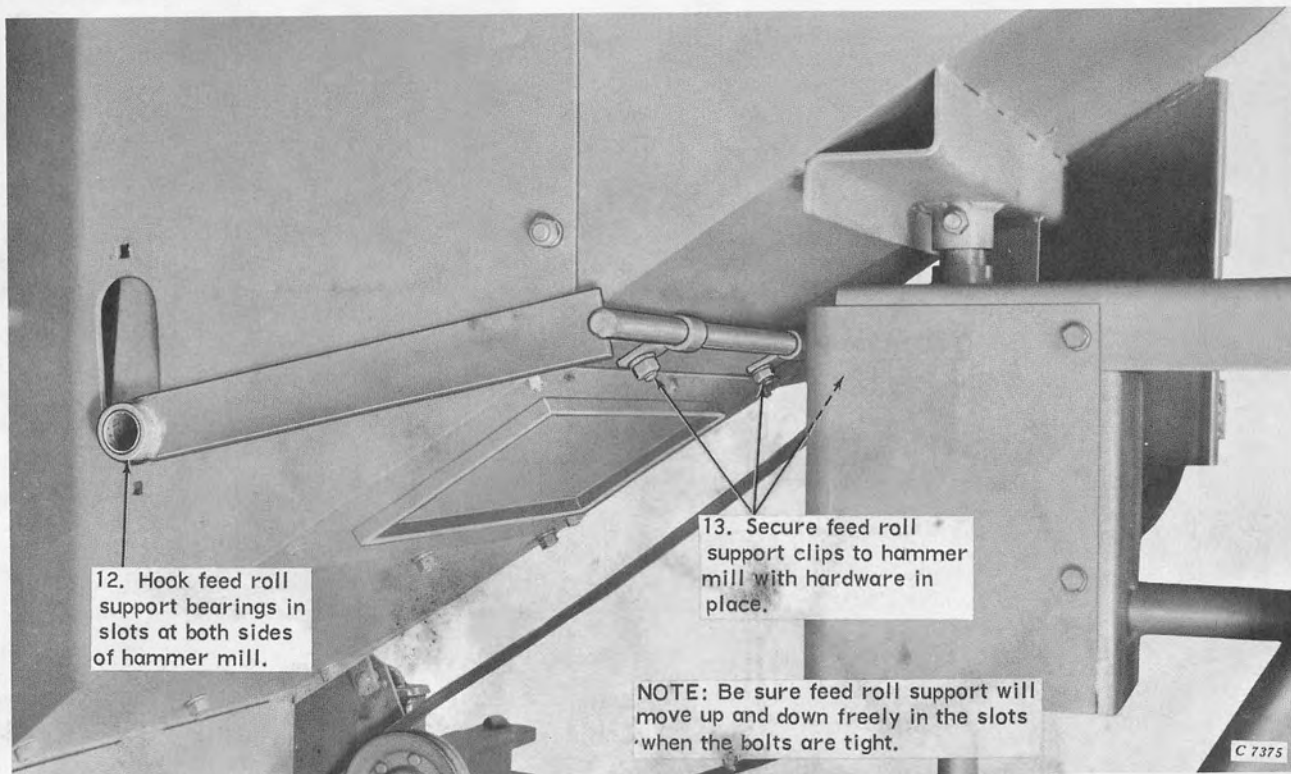
FEED ROLL



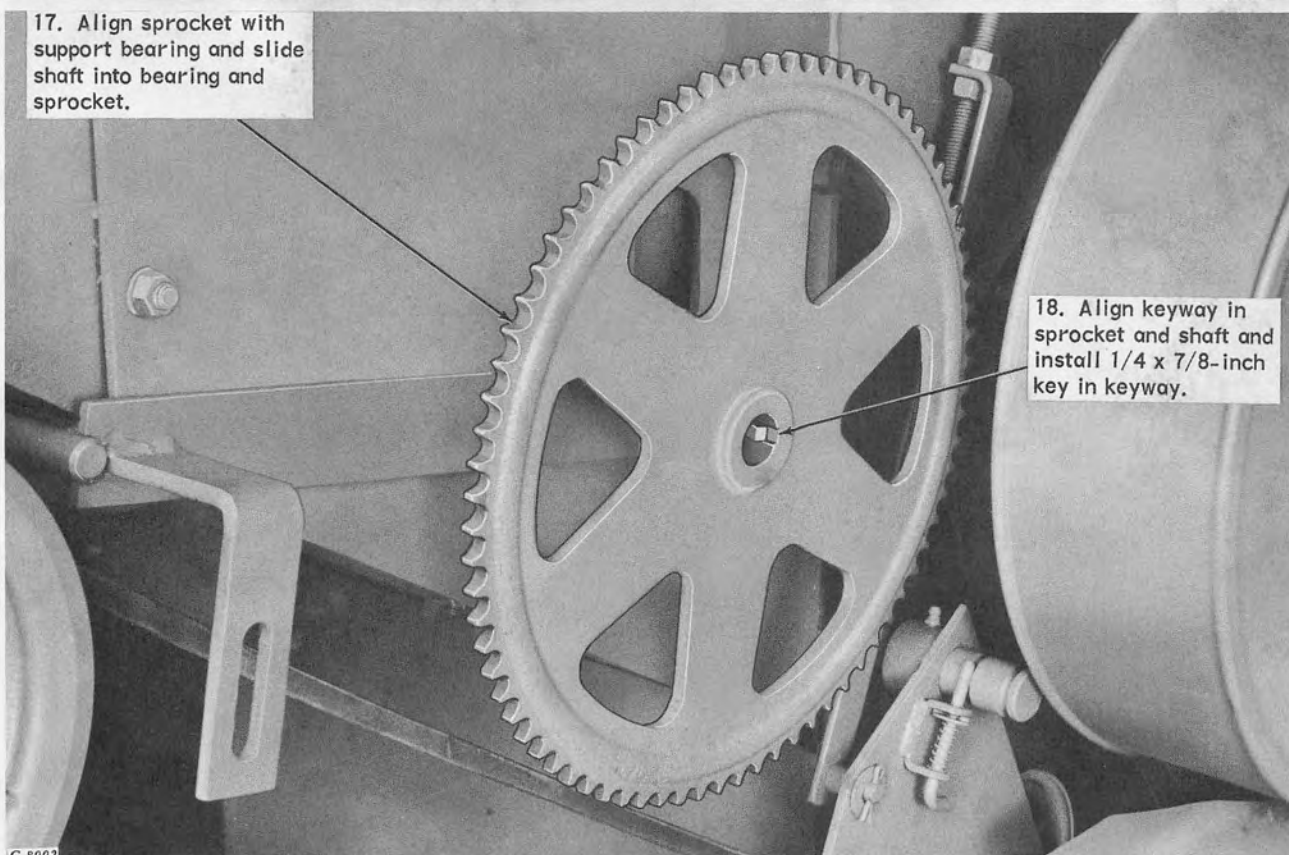
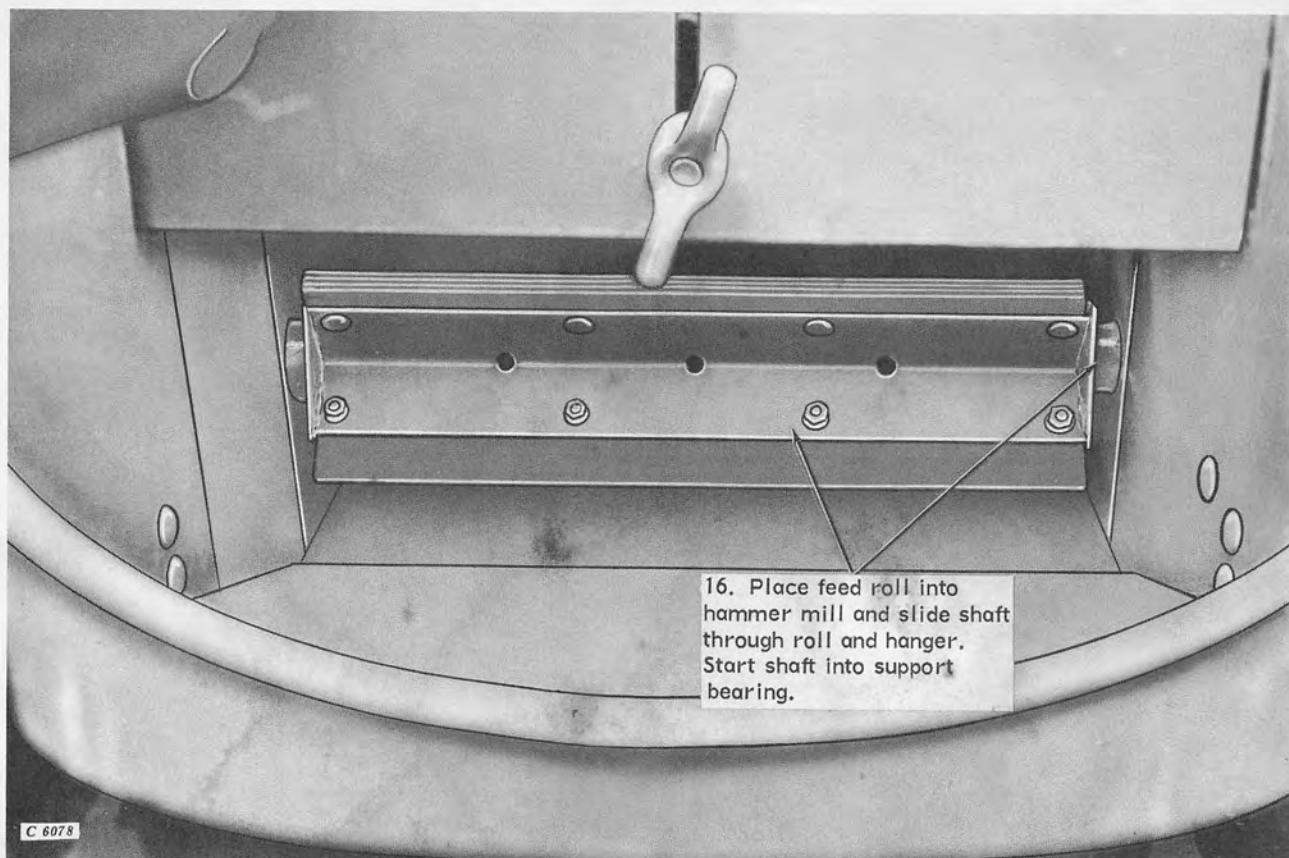


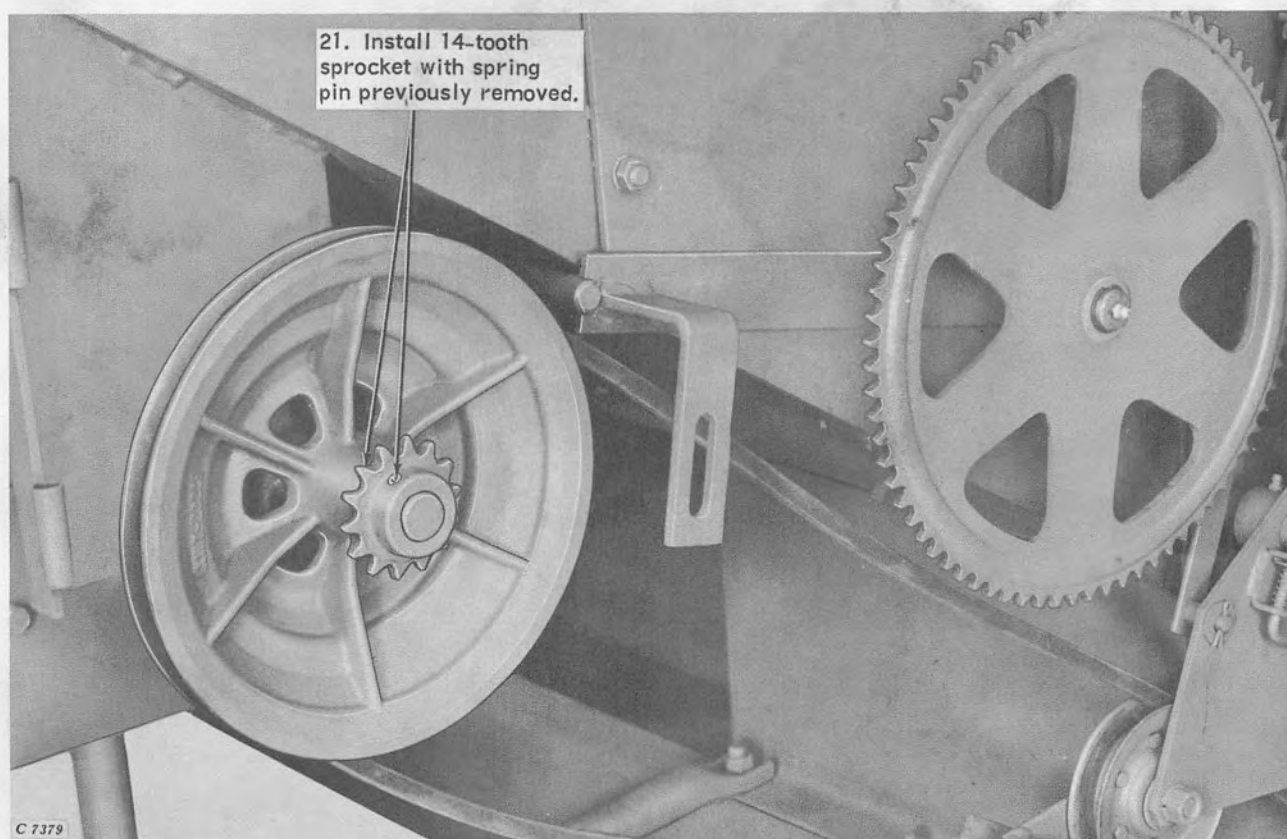
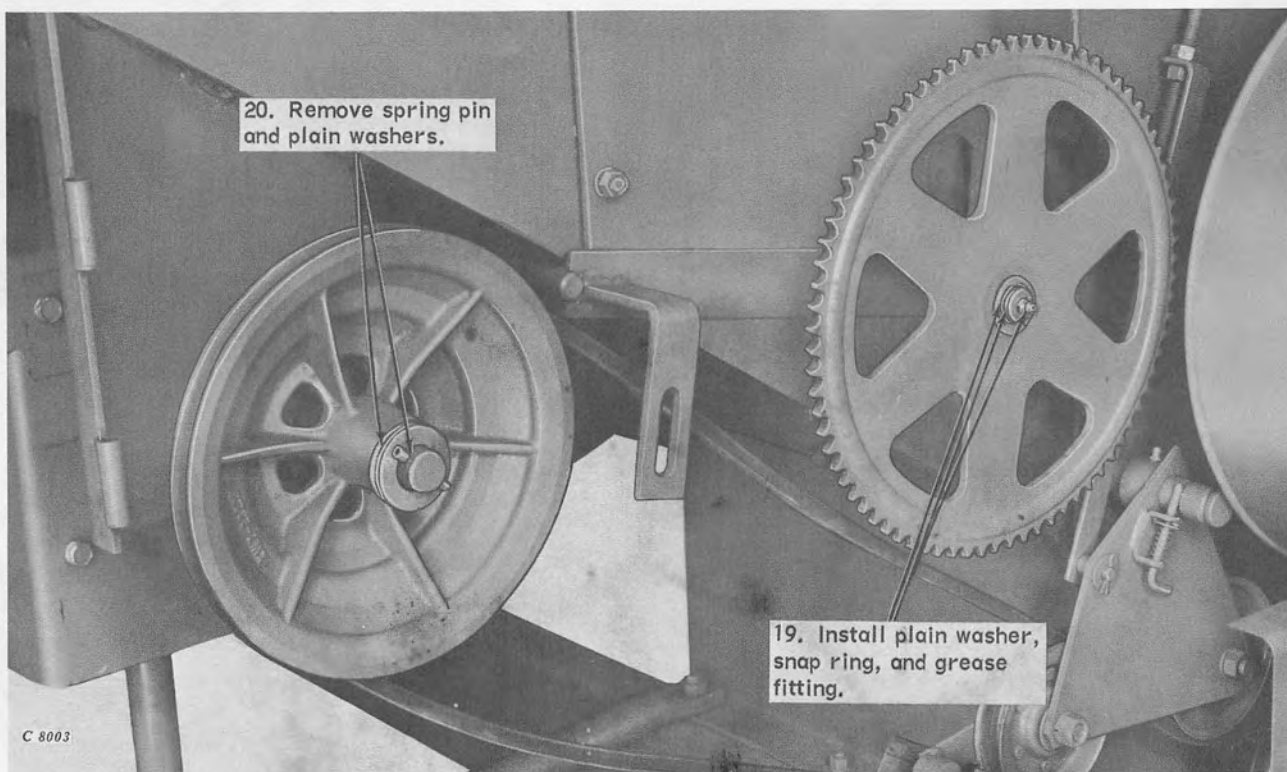
FEED ROLL—Continued



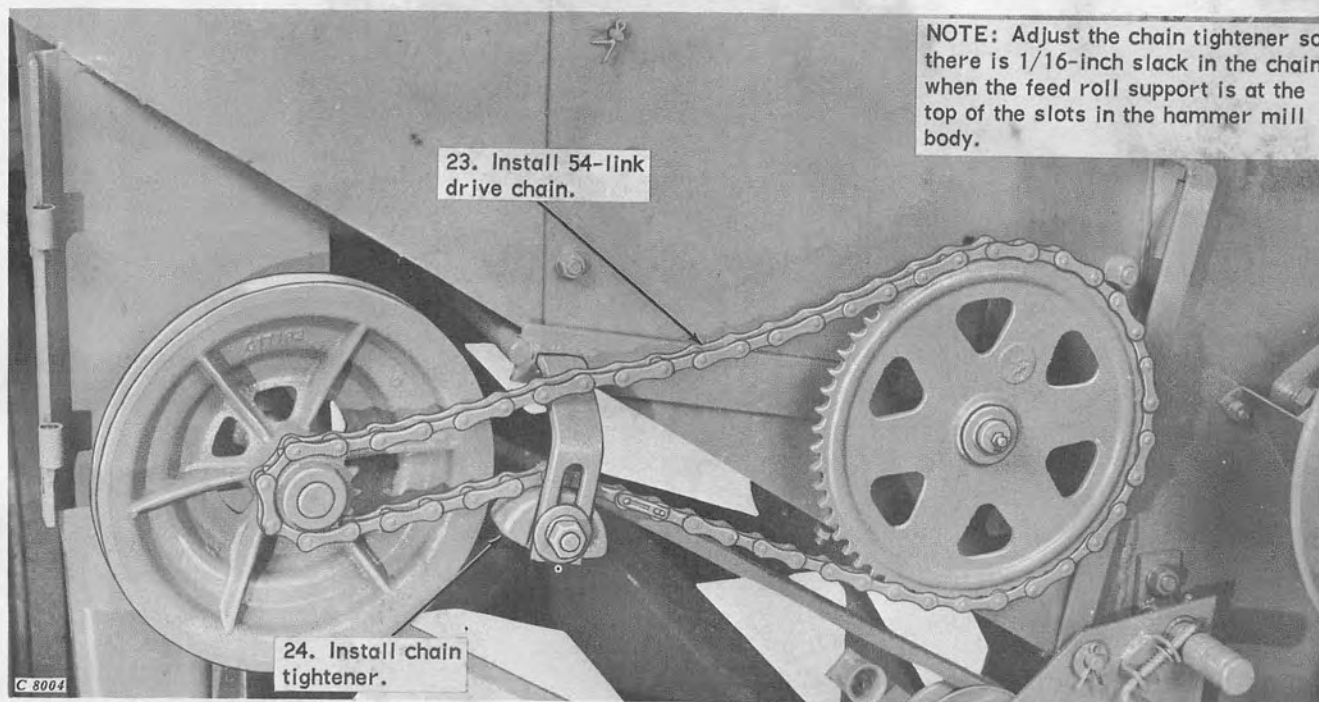
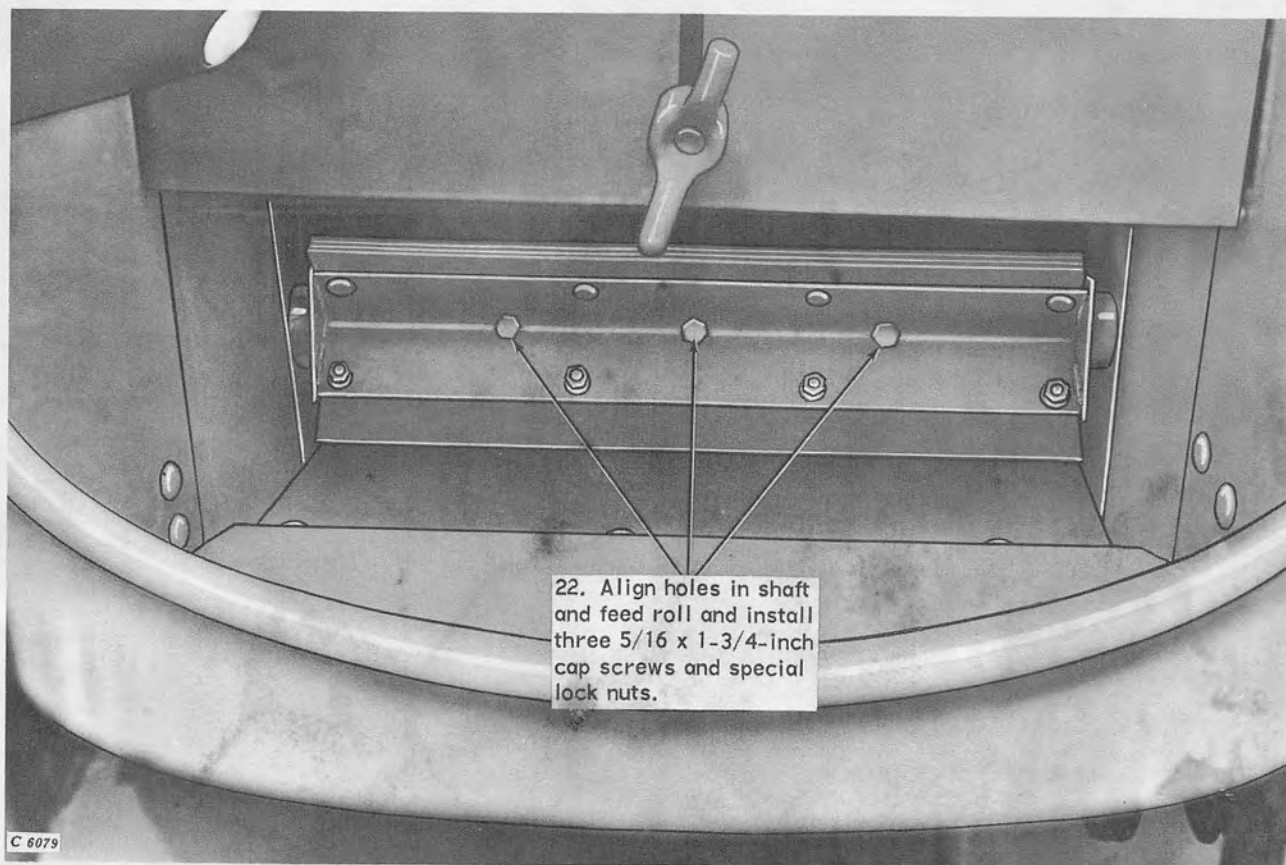


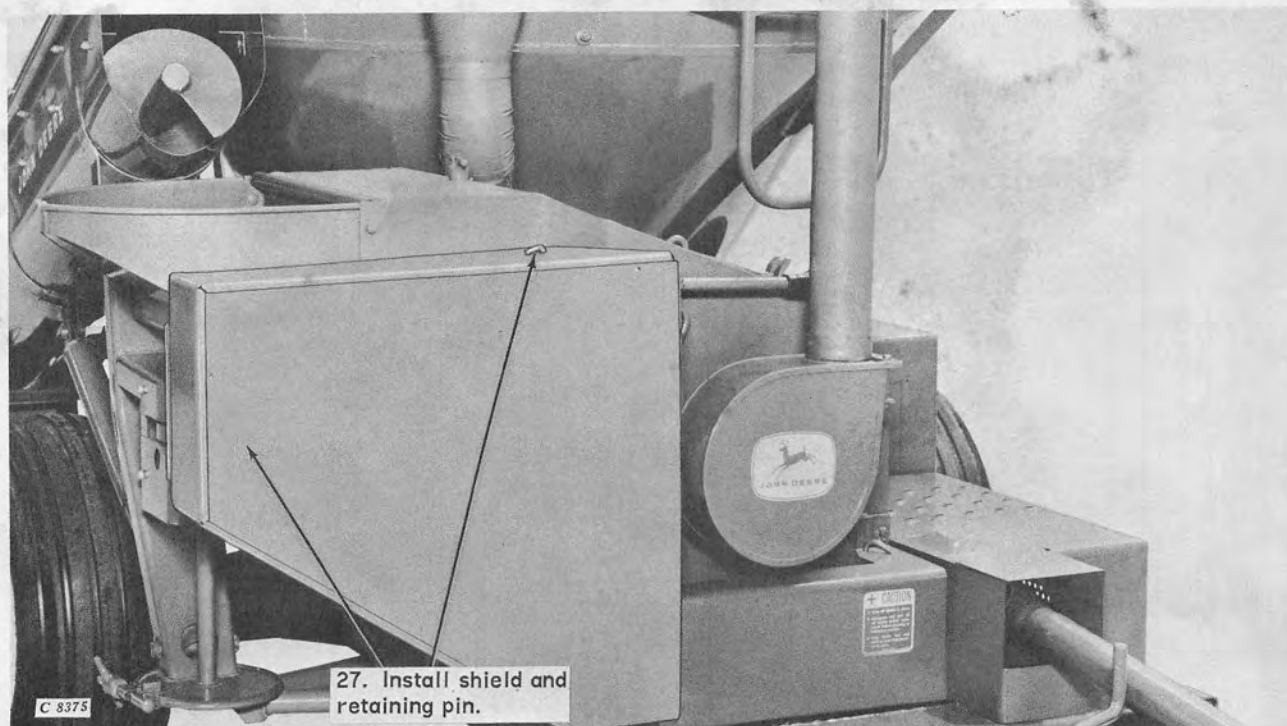
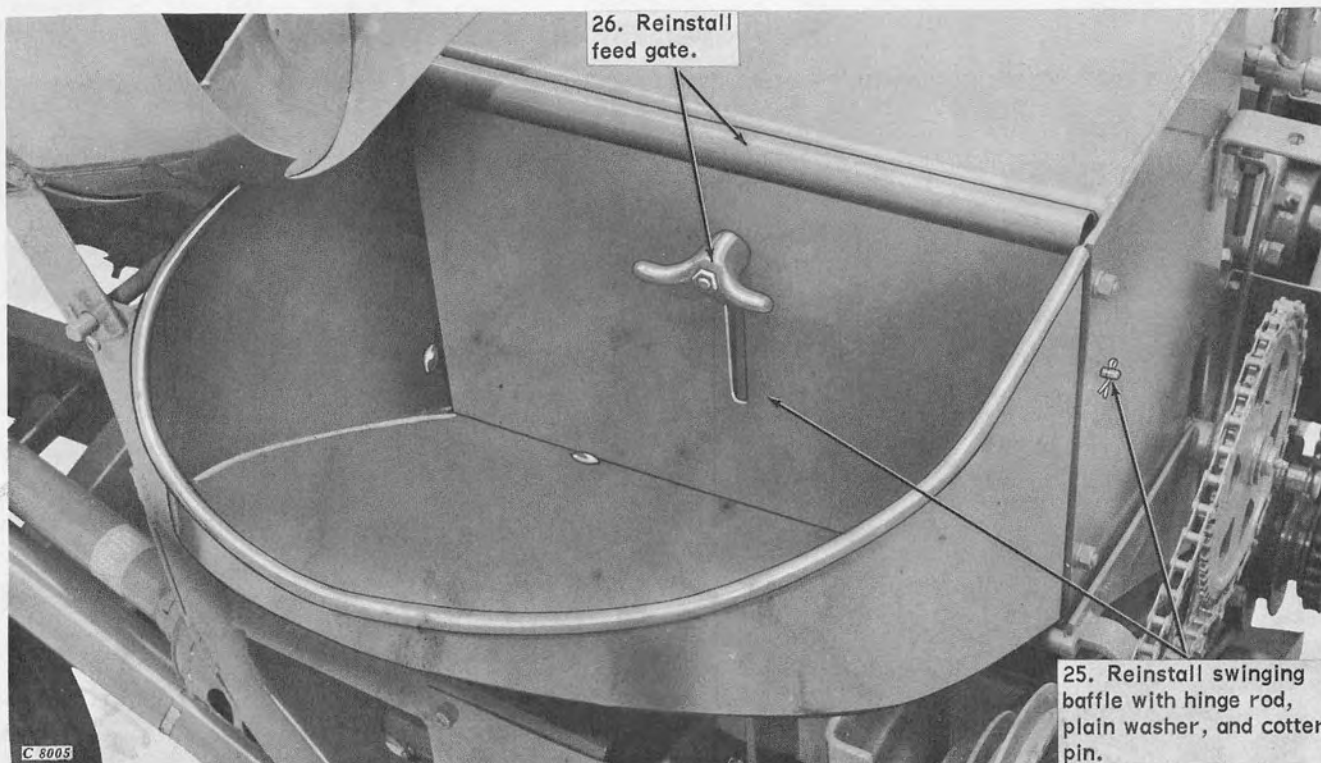
FEED ROLL—Continued



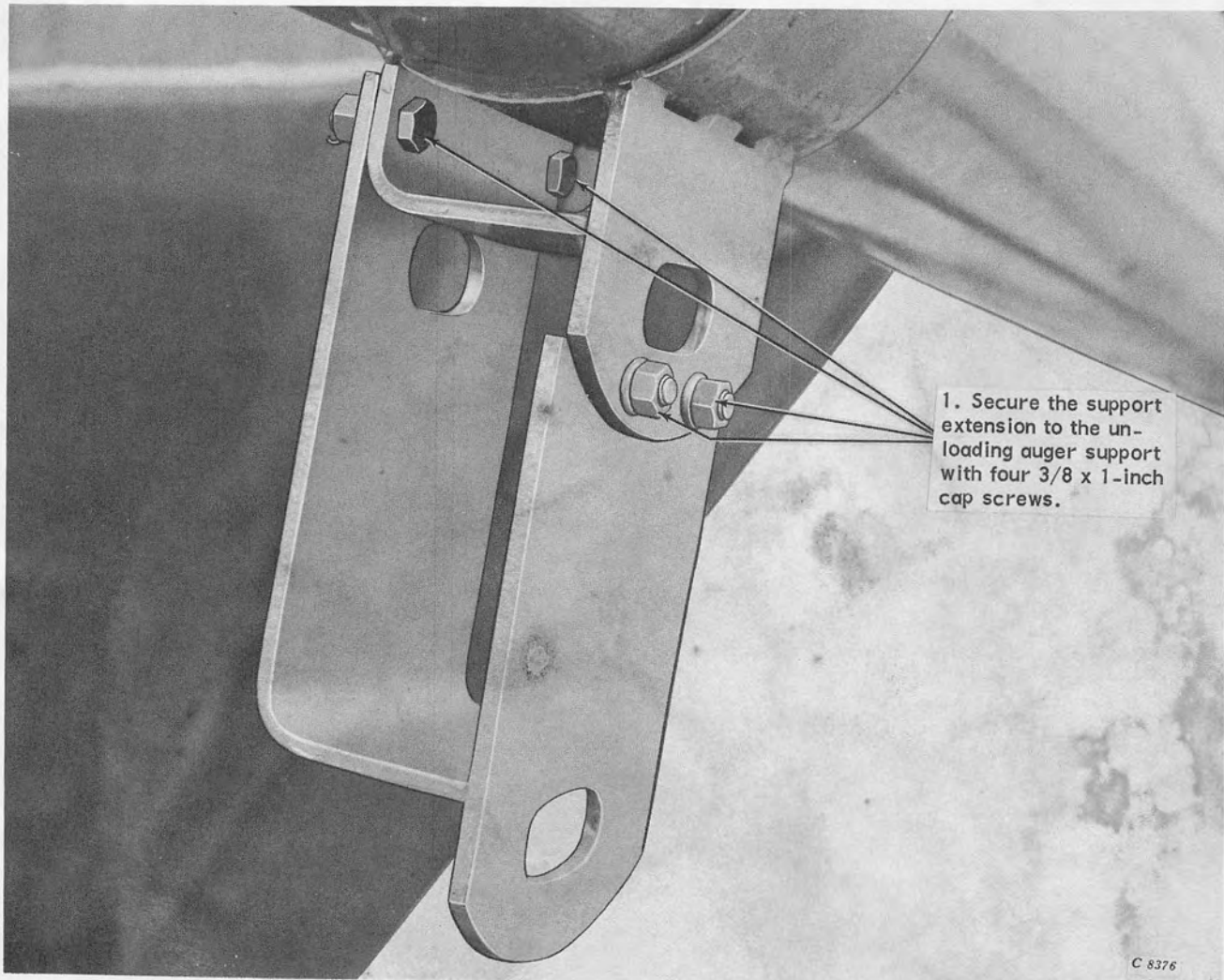


FEED ROLL—Continued





UNLOADING AUGER SUPPORT EXTENSION



MEMORANDA

MEMORANDA

MEMORANDA

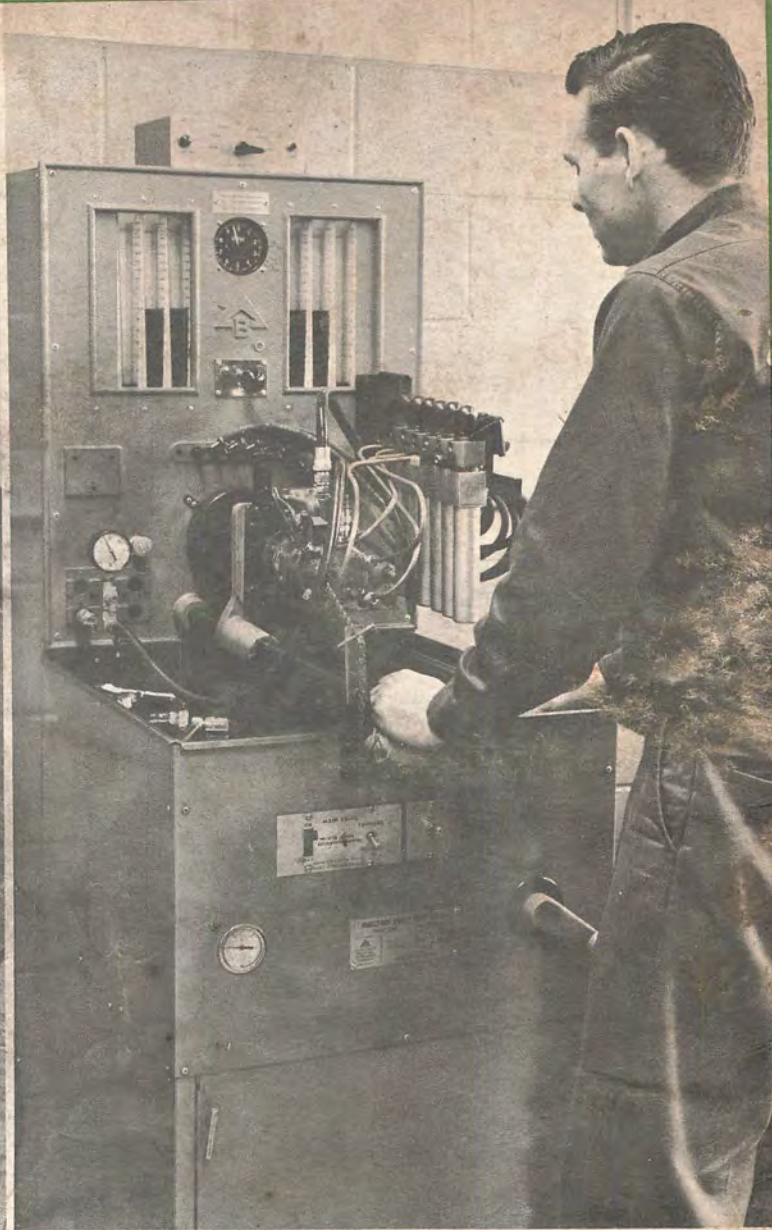


nobody can fill them like you can!

That's what the owner of this pair of work shoes is finding out—the hard way. Through a careless action, he has become the victim of an accident. It's a mighty tough way to find out that nobody else can wear your shoes or practice safety for you. And a needless, costly lesson to learn that safety is an everyday need.

Put safety into each of your workdays; read the operator's manual thoroughly; know how to operate each machine properly and safely; take the safety precautions specified; think before you act.

Make sure you wear your "shoes" everyday. Outfit yourself with a safety program now.



Dependable John Deere Parts and Service

A Bedrock Backing of Your Decision to Go with The Long Green Line

Behind every product in *John Deere's Long Green Line* stands a reliable John Deere dealer ready to serve you in time of need with dependable parts and service.

The seasons run early in his Parts Department — his well-stocked shelves of seasonal (and *Genuine*) John Deere Parts will help hold your downtime to a minimum. Service is another phase of his business that is vital to you. Working with modern equipment and guided by factory-prepared service manuals, his service

specialists can pinpoint trouble with little delay; eliminate it efficiently and without costly waste effort.

You can move through your entire year's operations comfortably assured that your John Deere dealer has anticipated your needs and stands ready to help solve your problems. Your competent dealer is one more assurance of the greater satisfaction and value you'll enjoy when you invest in *The Long Green Line of John Deere Equipment*.